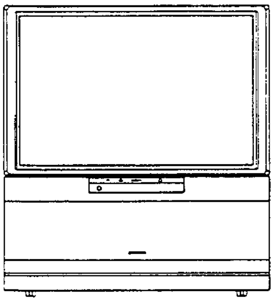
PIONEER
The Art of Entertainment

Service Manual



ORDER NO.
ARP2876

PROJECTION MONITOR RECEIVER

SD-P5181-K

SD-P4681-K

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model		Power Requirement	Remarks
	SD-P5181-K	SD-P4681-K		
KUX1C	○	○	AC 120V	

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O-ISO FEB. 1995 Printed in Japan

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

NOTES
(FOR CANADIAN MODEL ONLY)
Fuse symbols ▭ (fast operating fuse) and/or ▭☒ (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible ▭ (fusible de type rapide) et/ou ▭☒ (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

1. SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis or picture tube.
The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled.
   Keep picture tube away from the body while handling.
2. When service is required, even though the PROJECTION MONITOR RECEIVER an isolation transformer should be inserted between power line and the set in safety before any service is performed.
3. When replacing a chassis in the set, all the protective devices must be put back in place, such as barriers, nonmetallic knobs, adjustment and compartment covershields, isolation resistor-capacitor, etc.
4. When service is required, observe the original lead dress.
   Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area.
5. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacture's.
   Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced set to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the set by the manufacturer has become defective, or inadvertently defeated during servicing.

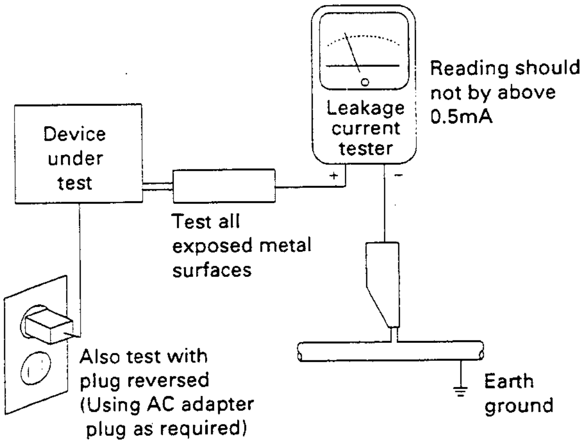
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

Leakage Current Cold Check
With the AC plug removed from the 120V AC 60Hz source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC 500V), connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (input/ output terminals, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3MΩ and a maximum resistor reading of 5MΩ. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a 120V AC 60Hz outlet (do not use an isolation transformer for this check). Turn the AC power switch on.

Using a "Leakage Current Tester (Simpson Model 229 equivalent)", measure for current from all exposed metal parts of the cabinet (input / output terminals, screwheads, metal overlays, control shaft, etc.), particularly any exposed metal part having a return path to the chassis, to a known earth ground (water pipe, conduit, etc.). Any current measured must not exceed 0.5mA.


Device under test
Leakage current tester
Reading should not by above 0.5mA
+
-
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE SET TO THE CUSTOMER.

High Voltage

This set is provided with a X-ray protection for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this Service Manual regarding this hold down circuit when servicing, so that this X-ray protection may correctly be operated.

Serviceman Warning

In the status of the black picture (video muting is being applied) when no signal is input, high voltage of this set during operation is less than 30.5kV. In case any component having some relation to the high voltage is replaced, confirm that the high voltage is lower than 30.5kV in the status of the black picture when no signal is input.

To measure H.V. use a high impedance H.V. meter.

Connect (-) to earth and (+)to the FBT anode cable connector.

(Refer to page 88)

X-radiation

TUBE: The primary source of X-radiation in this set is the picture tube.

For continued X-radiation protection, the replacement tube must be the same type as the original, PIONEER approved type.

The picture tube (CRT assy R, G, B) use in this set holds complete guarantee against X-ray radiation when the X-ray is sealed (See page 4). Accordingly, when the current in flowing to the picture tube (CRT assy R, G, B), be sure to perform it by putting the tube into X-ray sealed applied state. Avoid absolutely to flow the current to the picture tube (CRT assy R, G, B) itself. Moreover, when the voltage of the high voltage circuit becomes abnormally a little higher, the picture tube radiates X-rays. Accordingly, when servicing the high voltage circuit be sure to replace as an assy with the POWER SUPPLY assy in the manner in which has been adjusted to perform normal operation.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in PIONEER set have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such featuresare identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one shown in the parts list in this Service Manual, may create shock, fire, X-radiation, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

3. CHARGED SECTION, HIGH VOLTAGE GENERATING POINT AND X-RAY PROTECTION

■ Charged section

The circuit in which the commercial AC power is used as it is without passing through the power supply transformer. If the charged section is touched, there is a risk of electric shock. In addition, the measuring equipment can be damaged if it is connected to the GND of the charged section and the GND of the non-charged section while connecting the set directly to the commercial AC power supply. In this case, be sure to connect the set via an insulated transformer and supply the current.

■ Charged section (Power supply primary side)

1. The primary side of the POWER SUPPLY assy
2. AC power cord
3. MAIN POWER switch

▨ part is the charged section.

░ part is the high voltage generating points other than the charged section.

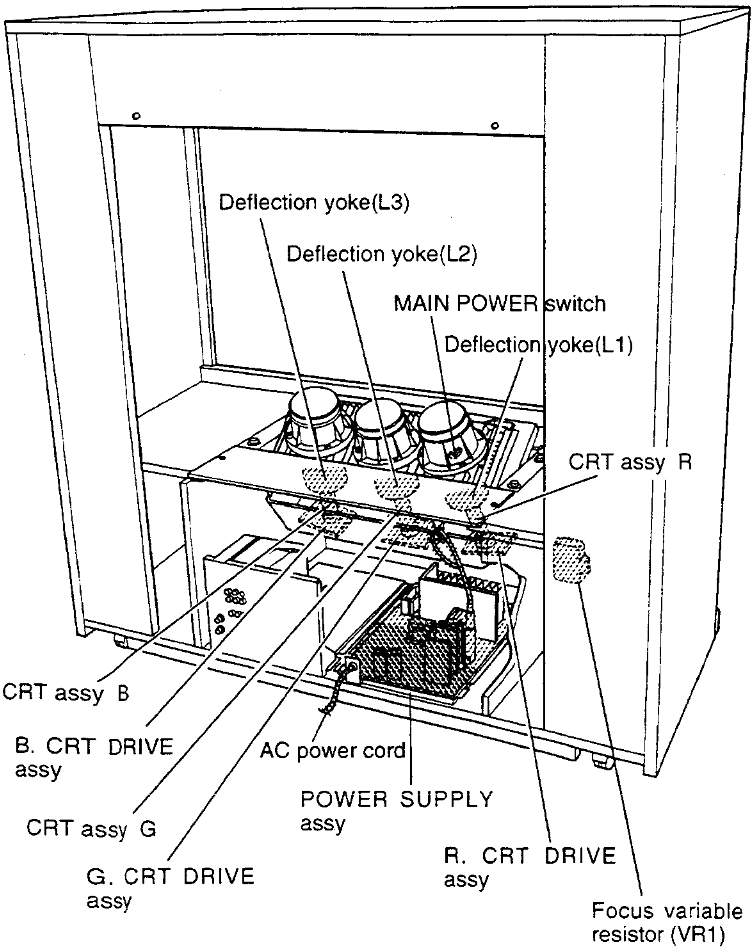


Fig. 1 Charged section and high voltage generating point

■ High voltage generating point

The place where voltage of over 100V is generated.

1. Charged section	
2. POWER SUPPLY assy (including FBT)	(30.0kV, 135V)
3. R. CRT DRIVE assy	(10.5kV)
4. G. CRT DRIVE assy	(10.5kV)
5. B. CRT DRIVE assy	(10.5kV)
6. CRT assy R	(30.0kV)
7. CRT assy G	(30.0kV)
8. CRT assy B	(30.0kV)
9. Focus variable resistor(VR1)	(10.5kV)
10. Deflection yokes (L1, L2 and L3)	Approx. 1100V at perk

■X-ray protection

- Regarding the parts which are relative to radiation of X-rays (There is the danger to radiate X-ray from the individual CRT assy R, G, B), there are notifications of caution in the individual schematic diagrams. Be sure to read them for safety's sake.
- The component parts for X-ray protection are as follows : When the current flows to the CRT assy R, G, B, by sure to perform it with these parts being attached. Protection from the X-ray radiation is maintained in the state in which these parts have been installed to the CRT assy R, G, B. Accordingly, never supply current only to the CRT assy R,G,B.
  Moreover, the anode voltage of the CRT assy R, G, B should always be kept not higher than the predetermined value (in the minimum brightness and picture state when non signal input is higher than 30.5kV). Be sure to drive the CRT assy R, G, B by using a completely functional POWER SUPPLY assy which have been adjusted completely in the combined state. (When the voltage abnormally becomes high, the X-ray protection circuit will operate.)

1. CRT assy R, G, B (Do not dismantle CRT assemblies under any circumstances.)
2. Each Lens assy

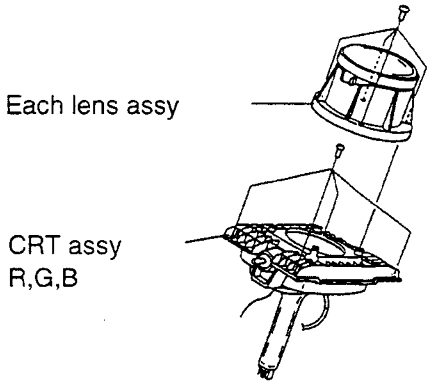


Fig. 2 Component parts for X-ray protection

4. EXPLODED VIEWS,PACKING AND PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The " ⚠ " mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉ " are not always kept in stock. Their delivery time may be longer than usual or they may by unavailable.*
- *Parts marked by ☆ are important parts which relate in X-rays radiation.*

  If any of these parts need to be replaced, always replace with specified parts.
- For POWER SUPPLY ASS'Y,AWV1479 is used,but for servicing,AWV1496 is supplied.

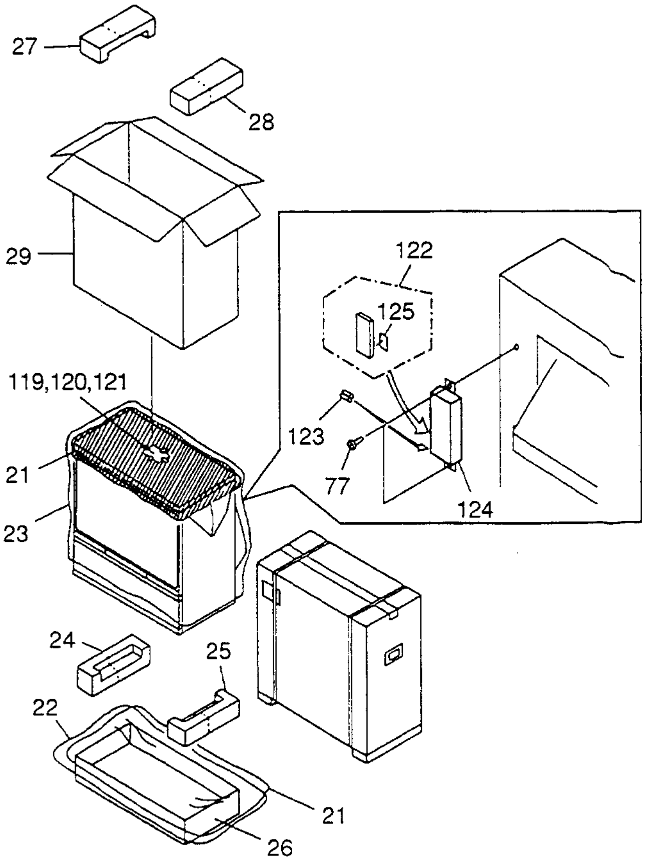
  AWV1496 is the same as AWV1479 of which X-ray protection and high voltage sections have been adjusted and these adjusted parts are coverd with the shield cases. Therefore,AWV1496 need not be adjusted.

PARTS LIST (FOR SD-P5181-K,SD-P4681-K)

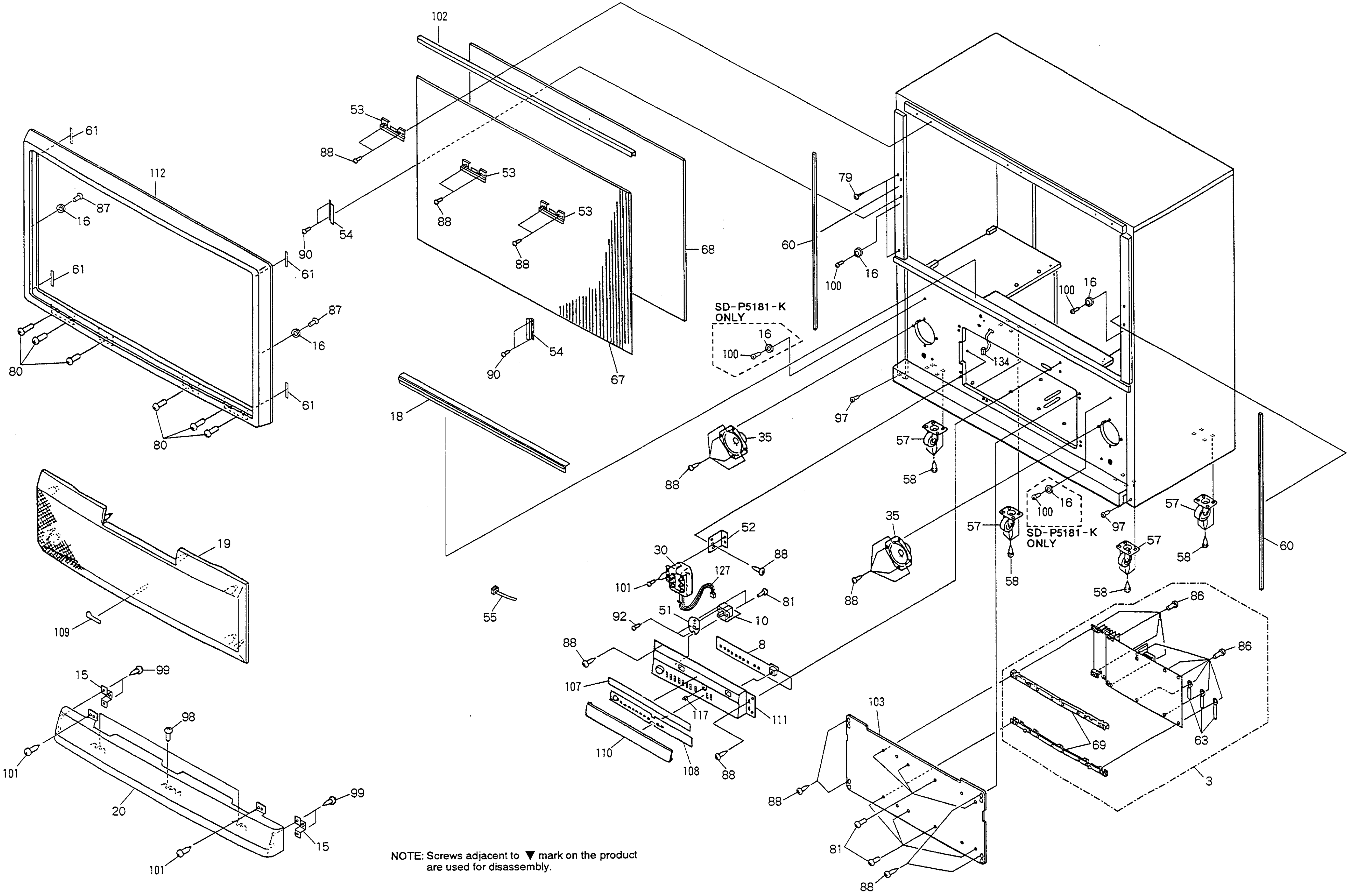
Mark	No.	Description	Parts No.
	1	TUNER·VIDEO ASS'Y	AWV1478
☆	2	POWER SUPPLY ASS'Y	AWV1496
	3	CONVERGENCE ASS'Y	AWZ5967
	4	R.CRT DRIVE ASS'Y	AWZ5968
	5	G.CRT DRIVE ASS'Y	AWZ5969
	6	B.CRT DRIVE ASS'Y	AWZ5970
	7	AV I/O ASSY	AWZ5971
	8	FRONT CONTROL ASS'Y	AWZ5972
	9	V-AMP ASSY	AWZ5973
	10	POWER SW ASSY	AWZ5974
	11	A CONNECTOR ASSY	AWZ5975
	12	B CONNECTOR ASSY	AWZ5976
	13	TV FRONT-END SYSTEM UNIT	AXF1077
	14	RF SWITCH	AXF1078
NSP	15	BOTTOM RAIL HOLDER	ANG1991
	16	MAGIC TAPE	AEC1394
	17	V ROCK 20M	AEC1610
	18	SCREEN HOLDER LOW 51 (SD-P5181-K)	AAP1503
	18	SCREEN HOLDER LOW 46 (SD-P4681-K)	AAP1504
	19	GRILLE 51 (SD-P5181-K)	AMR2711
	19	GRILLE 46 (SD-P4681-K)	AMR2712
	20	BOTTOM RAIL 51 (SD-P5181-K)	AMR2714
	20	BOTTOM RAIL 46 (SD-P4681-K)	AMR2715
NSP	21	PACKING SHEET	AHG1156
NSP	22	PACKING SHEET M	AHG1094
NSP	23	VINYL SHEET XL	AHG1095
	24	UNDER PAD L	AHA2058
	25	UNDER PAD R	AHA2059
	26	UNDER CARTON (51) (SD-P5181-K)	AHD2793
	26	UNDER CARTON (46) (SD-P4681-K)	AHD2798
	27	UPPER PAD L	AHA2056
	28	UPPER PAD R	AHA2057
	29	UPPER CARTON (51) (SD-P5181-K)	AHD2792
	29	UPPER CARTON (46) (SD-P4681-K)	AHD2797
⚠	30	FOCUS VR	ACX1096
⚠	31	DEFLECTION YOKE (L1 - L3)	ATL1086
⚠	32	FUSE FU103 (6.3A/125V)	AEK-309
⚠	33	FUSE FU105 (6.3A/125V)	AEK-309
⚠	34	FUSE FU106 (4 A/125V)	AEK1018
	35	CONE SPEAKER	APV1023
⚠	36	AC POWER CORD	ADG1058
☆⚠	37	CRT ASS'Y50(G) (SD-P5181-K)	AWY1311
☆⚠	37	CRT ASS'Y46(G) (SD-P4681-K)	AWY1314
☆⚠	38	CRT ASS'Y50(R) (SD-P5181-K)	AWY1312
☆⚠	38	CRT ASS'Y46(R) (SD-P4681-K)	AWY1315
☆⚠	39	CRT ASS'Y50(B) (SD-P5181-K)	AWY1313
☆⚠	39	CRT ASS'Y46(B) (SD-P4681-K)	AWY1316
NSP	40	CHASSIS L	ANA1166
NSP	41	CRT STAND (51)	ANA1500
NSP	41	CRT STAND (46)	ANA1501
NSP	42	CRT STAND HOLDER L	ANA1503
NSP	43	CRT STAND HOLDER R	ANA1504
NSP	44	CHASSIS R	ANA1505
NSP	45	TRAY (PLS)	AMR2563
	46	REAR PANEL	ANC2257
⚠	47	ANODE CABLE	ADY1012
NSP	48	PCB STAND	ANG1640
NSP	49	PCB FRAME	ANG1641
NSP	50	CORD PLATE	ANG1650
NSP	51	SWITCH HOLDER	ANG1945
NSP	52	VR HOLDER	ANG1956
NSP	53	SCREEN METAL FITTING	ANG1992
NSP	54	SCREEN SIDE FITTING	ANG1993
	55	NYLON BINDER	AEC-093
	56	RIVET	AEC-441
	57	CASTER	AMR2547
	58	SCREW	ABA1126
NSP	59	LEAD CLAMPER M	AEC1611
	60	SCREEN CUSHION 51 (SD-P5181-K)	AEC1612
	60	SCREEN CUSHION 46 (SD-P4681-K)	AEC1616
	61	FRAME CUSHION (SD-P5181-K)	AEC1618
	61	FRAME CUSHION 46 (SD-P4681-K)	AEC1619
	62	CORD STOPPER	AEP-113
	63	BINDER	AEP-215
☆	64	LENS ASSEMBLY (R)	AMR2387
☆	65	LENS ASSEMBLY (G)	AMR2388
☆	66	LENS ASSEMBLY (B)	AMR2389
	67	LENTICULAR SHEET 51 (SD-P5181-K)	AMR2726
	67	LENTICULAR SHEET 46 (SD-P4681-K)	AMR2730

Mark	No.	Description	Parts No.
	68	FRESNEL (51) (SD-P5181-K)	AMR2758
	68	FRESNEL (46) (SD-P4681-K)	AMR2759
NSP	69	CONVERGENCE STAY	AND1058
	70	SCREW	BBZ30P080FCU
⚠	71	FUSE FU101(8A/125V)	AEK1002
	72	SCREW	ABA1080
	73	SCREW	ABA1099
	74	SCREW	ABA1121
	75	SCREW	ABA1149
	76	SCREW (STEEL)	ABA1168
	77	SCREW	ABA1188
	78	M5 SCREW	ABA1189
	79	SCREW (STEEL)	ABA1190
	80	SCREW	ABA1225
	81	SCREW	ABZ30P080FZK
	82	SCREW	ABZ30P100FMC
	83	SCREW	ABZ30P120FZK
	84	SCREW	ACZ40P080FMC
	85	SCREW	AMZ40P080FZK
	86	SCREW	BBZ30P080FZK
	87	SCREW	BPZ30P120FZK
	88	SCREW	BYC35P160FZK
	89	SCREW	BYC40P160FMC
	90	SCREW	BYC40P180FMC
	91	SCREW	FBT40P120FZK
	92	SCREW	PMB30P080FZK
	93	SCREW	VBT30P080FZK
	94	SCREW	VBZ30P200FMC
	95	SCREW	VCZ30P060FMC
	96	SCREW	VPZ40P160FZK
	97	SCREW	ABA1121
	98	SCREW	ABA1223
	99	SCREW	BYC35P120FZB
	100	SCREW	BYC35P160FZB
	101	SCREW	BBZ30P120FZK
	102	SCREEN HOLDER TOP 51 (SD-P5181-K)	AAP1500
	102	SCREEN HOLDER TOP 46 (SD-P4681-K)	AAP1501
	103	BLIND PLATE	AMM2414
	104	MIRROR SIDE HOLDER L	AMR2470
	105	MIRROR SIDE HOLDER R	AMR2471
	106	MIRROR HOLDER	AMR2718
	107	INDICATOR PANEL (SD-P5181-K)	AAK2616
	107	INDICATOR PANEL (SD-P4681-K)	AAK2624
	108	CONTROL SHEET	AAK2617
	109	BADGE	AAM1068
	110	DOOR	AAN1406
	111	CONTROL PANEL	AMB2524
	112	SCREEN FRAME ASS'Y 51 (SD-P5181-K)	AMB2547
	112	SCREEN FRAME ASS'Y 46 (SD-P4681-K)	AMB2548
	113	MIRROR CASE (51)	AME2296
NSP	114	BACK COVER PANEL 51	AMM2415
	115	REAR COVER	AMM2416
NSP	116	CRT BACK BOARD	AMM2417
	117	CATCHER F2M	AEC1609
	118	BLIND SHEET(PVC)	AEC1622
	119	OPERATING INSTRUCTIONS (English)	ARB1491
	120	ATTENTION CARD	ARM1054
	121	CONVERGENCE ATTENTION CARD	ARM1107
	122	REMOTE CONTOROL UNIT (CU-SD090)	AXD1414
NSP	123	ALKALINE(LR6,AA)	AEX1018
	124	CARTON (For Remote control unit and Battery)	AHC1018
	125	BATTERY COVER	AZA7027
	126	MIRROR	AMR2728
	127	4P HOUSING WIRE	ADX2179
	128	1P LEAD WIRE	ADX2180
	129	1P LEAD WIRE	ADX2181
	130	1P LEAD WIRE	ADX2182
	131	1P LEAD WIRE	ADX2183
	132	1P LEAD WIRE	ADX2184
	133	1P LEAD WIRE	ADX2185
	134	2P HOUSING WIRE	ADX2187

(1) PACKING



(2) FRONT VIEW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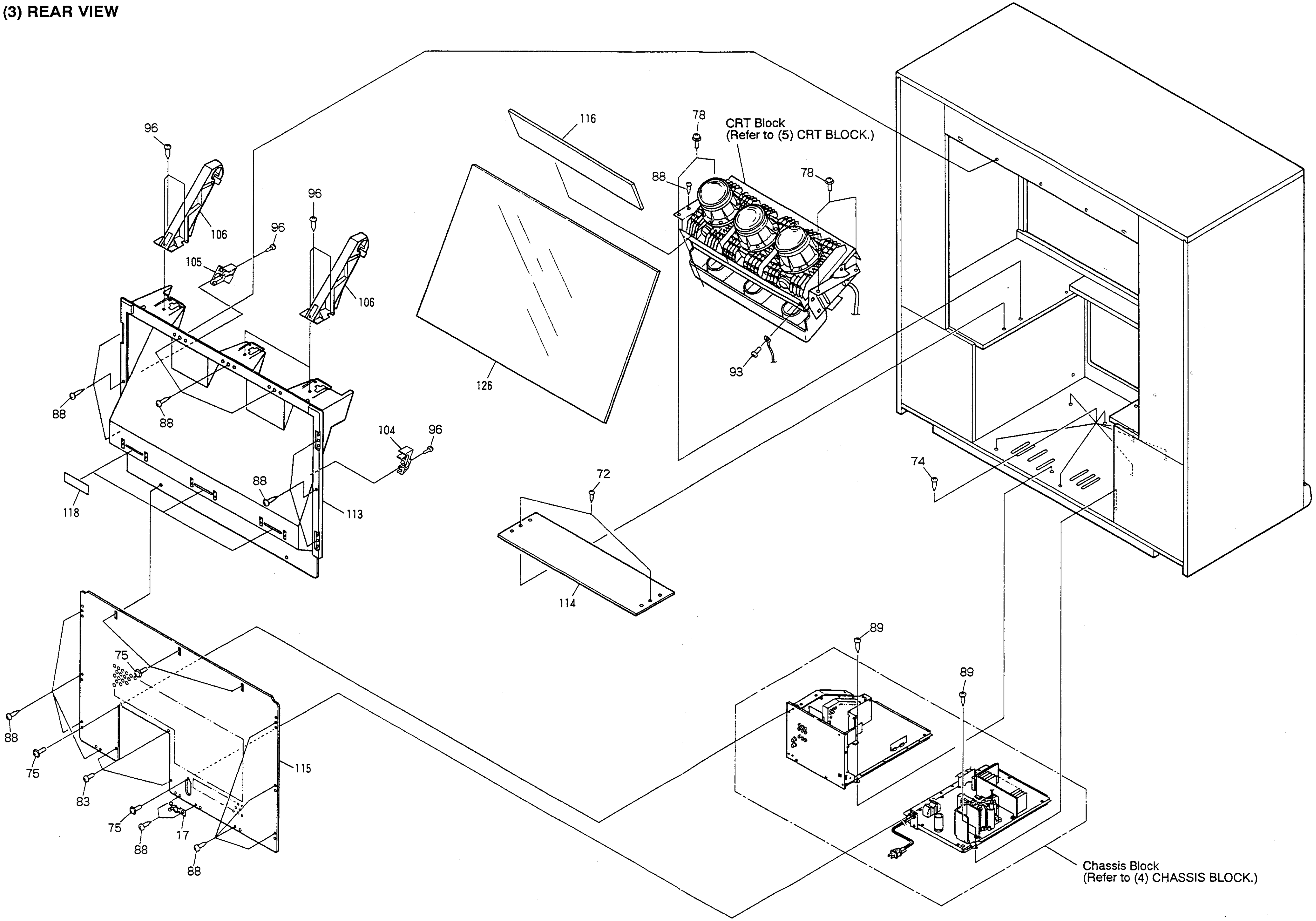
NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.

(3) REAR VIEW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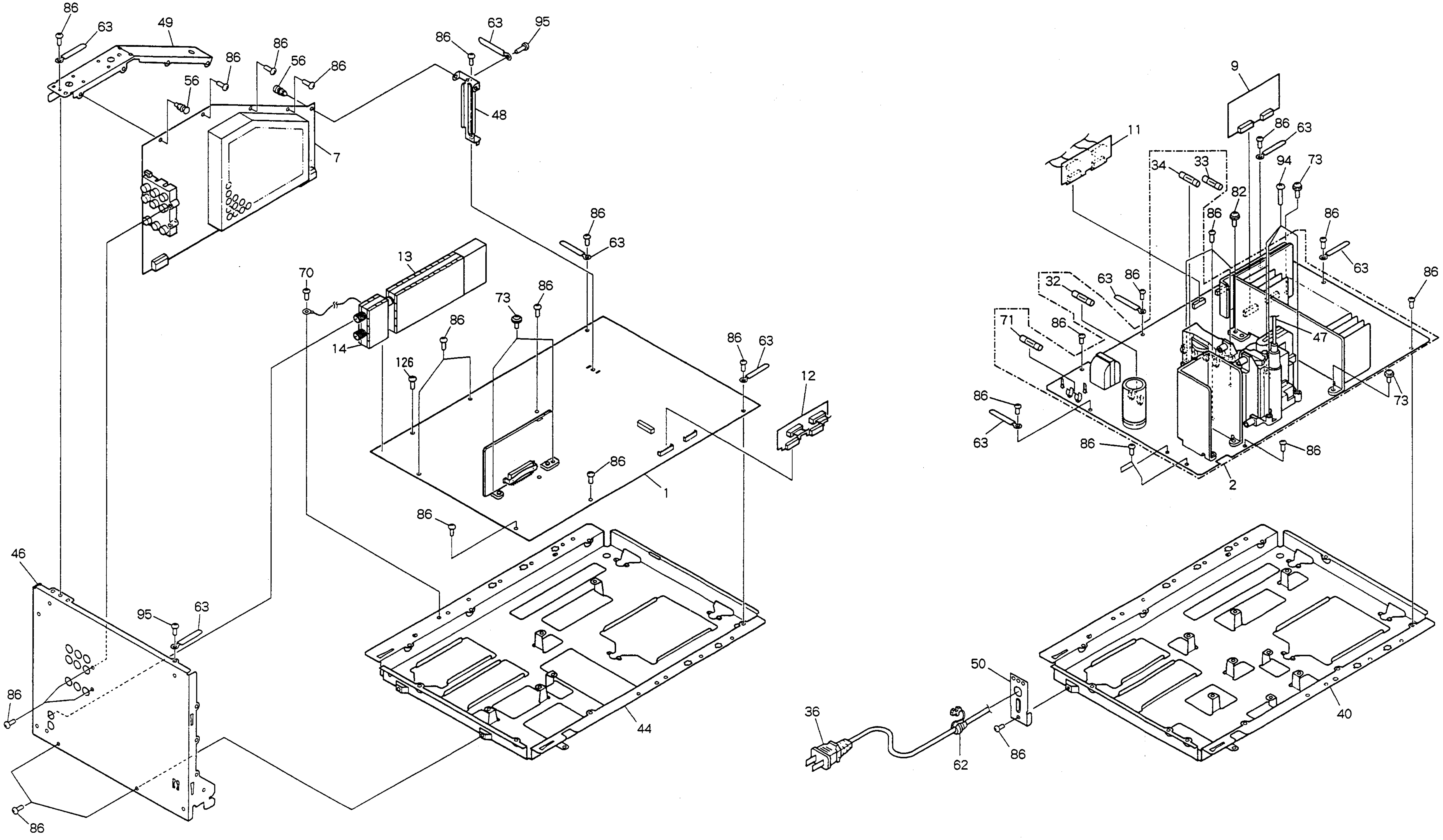
CRT Block
(Refer to (5) CRT BLOCK.)

Chassis Block
(Refer to (4) CHASSIS BLOCK.)

(4) CHASSIS BLOCK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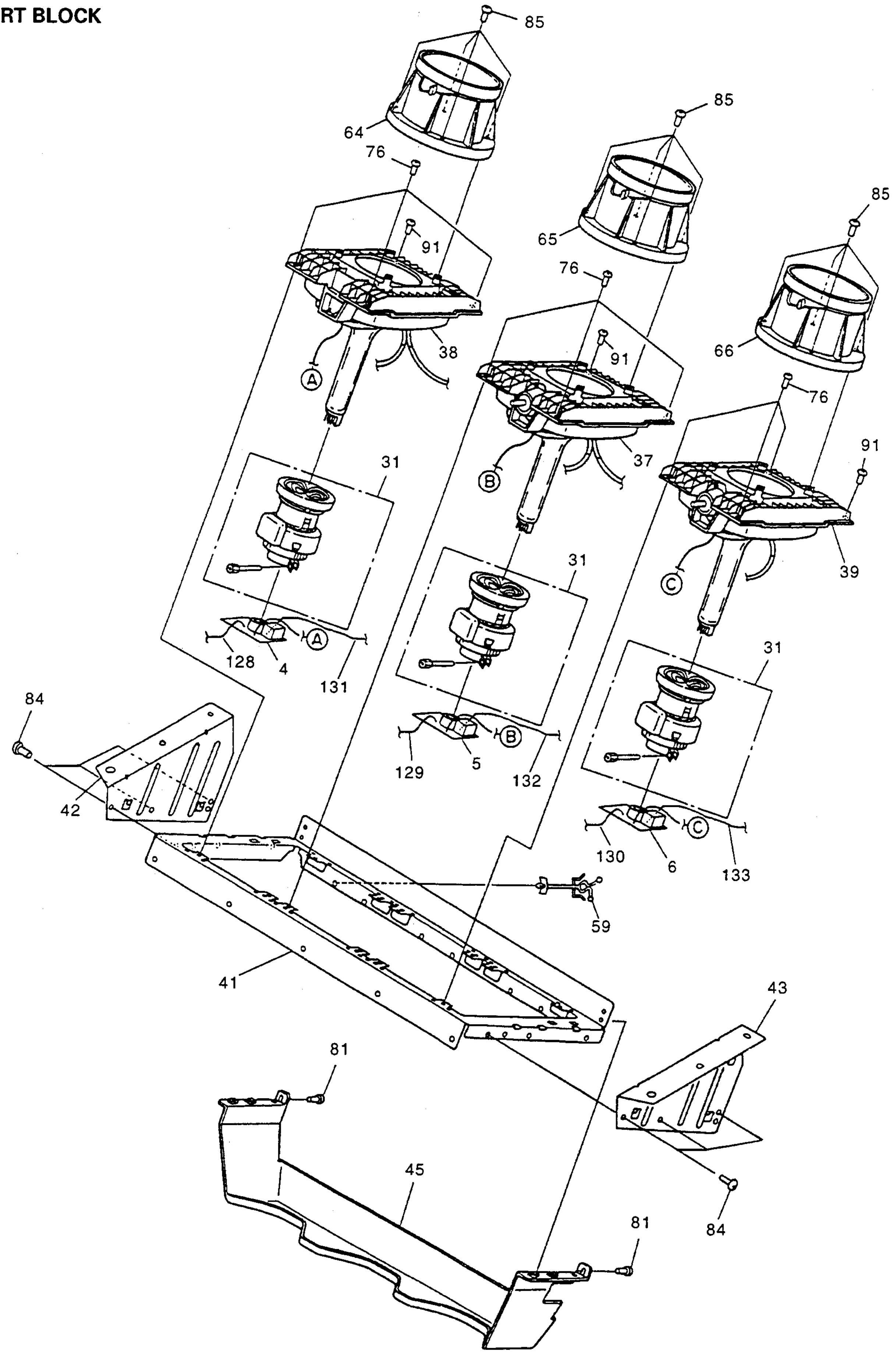
(5) CRT BLOCK



5. SCHEMATIC AND PCB CONNECTION DIAGRAMS

NOTE FOR SCHEMATIC DIAGRAMS (Type 5A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**

2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**

3. **RESISTORS:**
Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
Tolerance:(F):±1%, (G):±2%, (K):±10%, (M):±20% or ±5% unless otherwise noted.

4. **CAPACITORS:**
Unit : p:pF or µF unless otherwise noted.
Ratings : capacitor (µF) / voltage (V) unless otherwise noted.
Rated voltage : 50V except for electrolytic capacitors.

5. **COILS:**
Unit : m:mH or µH unless otherwise noted.

6. **VOLTAGE AND CURRENT:**
▭ or ←V :
DC voltage (V) at no input signal unless otherwise noted.
Value in (   ) is DC voltage at color bar signal input state.
⇐mA or ←mA :
DC current at no input signal unless otherwise noted.

7. **OTHERS:**
- ⊘ or ⊘ : Adjusting point.
- ◀ : Measurement point.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by ☆ are important parts which relate to X-rays radiation. If any of these parts needs to be replaced, always replace with specified parts.
- Parts marked by × are important parts which relate to X-rays radiation. If a failure occurs in any of these parts, replace the printed circuit board assembly where the relevant part has already been adjusted as a working component. Do not replace the actual part itself. If any part marked by × is replaced, there is danger of being exposed to X-rays.

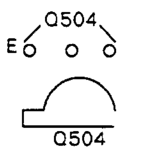
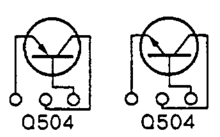
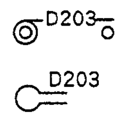
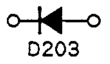
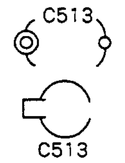
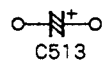
8. **SCH – □ ON THE SCHEMATIC DIAGRAM:**
- SCH– □ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)

9. **SWITCHES** (Underline indicates switch position):
POWER SW ASSY
S4201: MAIN POWER

FRONT CONTROL ASSY
S4101 : POWER STANDBY/ON
S4102 : DIGITAL P IN P ON/OFF
S4104 : DIGITAL P IN P INPUT
S4105 : FACTORY ADJ
S4106 : CHANNEL +
S4107 : VOLUME –
S4108 : VOLUME +
S4109 : INPUT SELECTOR
S4110 : CHANNEL –
S4111 : RETURN
S4112 : ANTENNA SELECTOR

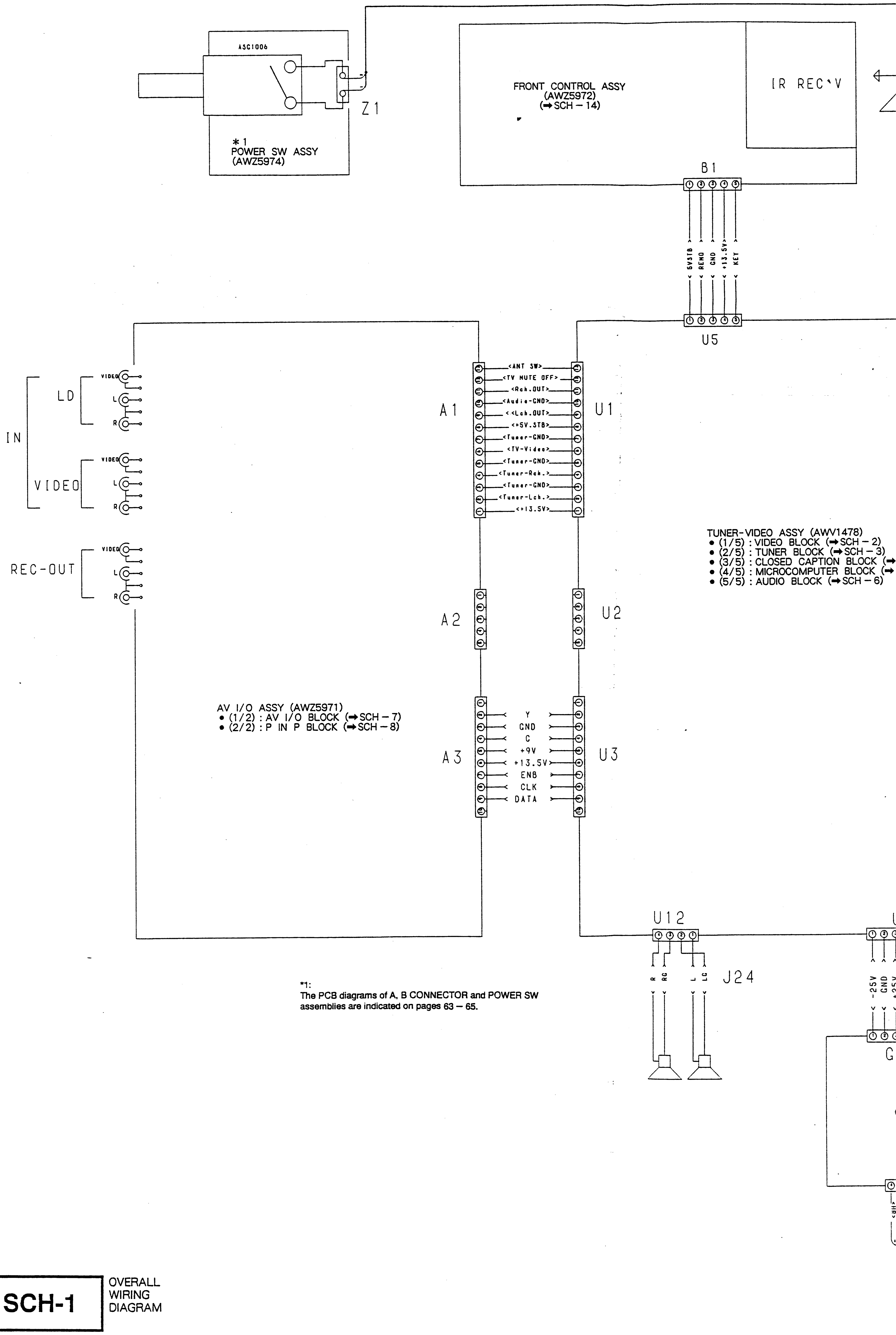
NOTE FOR PCB DIAGRAMS:

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
 Q504 E Q504	 Q504 Q504	Transistor
 D203 D203	 D203	Diode
 C513 C513	 C513	Capacitor (Polarized)

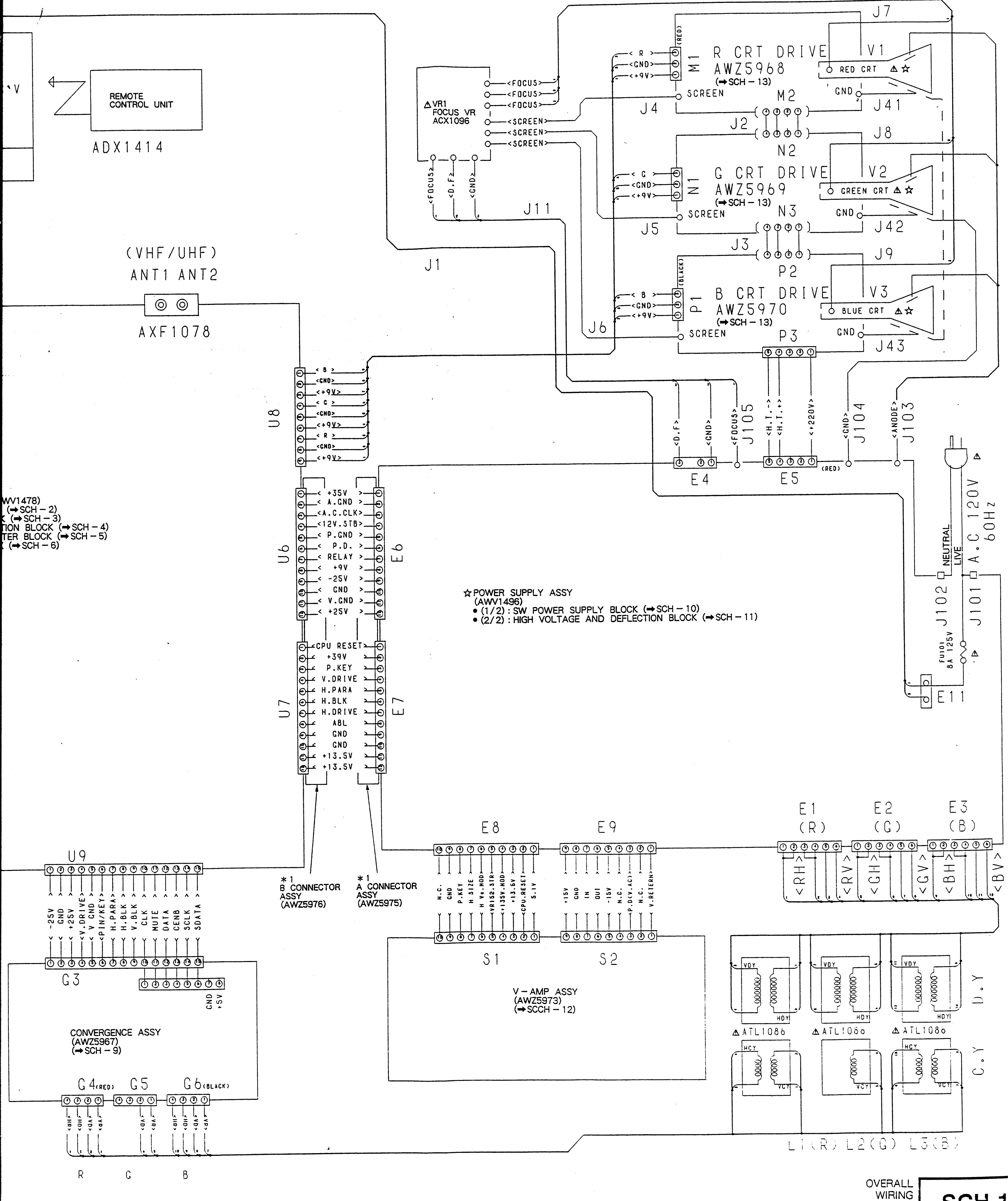
3. The transistor terminal marked with E or ⊏ shows the emitter.
4. The diode terminal marked with ◎ or ○= shows cathode side.
5. The capacitor terminal marked with ◎ or ⊏ shows negative terminal.

5.1 OVERALL WIRING DIAGRAM


ASC1006
Z1
*1
POWER SW ASSY
(AWZ5974)
FRONT CONTROL ASSY
(AWZ5972)
(➡SCH – 14)
IR REC'V
B1
<5VSTB>
<REMO>
<GND>
<+13.5V>
<KEY>
U5
IN
LD
VIDEO
REC-OUT
VIDEO
L
R
A1
U1
<ANT SW>
<TV MUTE OFF>
<Rch.OUT>
<Audio-GND>
<<Lch.OUT>
<+5V.STB>
<Tuner-GND>
<TV-Video>
<Tuner-GND>
<Tuner-Rch.>
<Tuner-GND>
<Tuner-Lch.>
<+13.5V>
TUNER-VIDEO ASSY (AWV1478)
• (1/5) : VIDEO BLOCK (➡SCH – 2)
• (2/5) : TUNER BLOCK (➡SCH – 3)
• (3/5) : CLOSED CAPTION BLOCK (➡
• (4/5) : MICROCOMPUTER BLOCK (➡
• (5/5) : AUDIO BLOCK (➡SCH – 6)
A2
U2
AV I/O ASSY (AWZ5971)
• (1/2) : AV I/O BLOCK (➡SCH – 7)
• (2/2) : P IN P BLOCK (➡SCH – 8)
A3
U3
<Y>
<GND>
<C>
<+9V>
<+13.5V>
<ENB>
<CLK>
<DATA>
U12
J24
<R>
<RG>
<L>
<LG>
<-25V>
<GND>
G

*1:
The PCB diagrams of A, B CONNECTOR and POWER SW assemblies are indicated on pages 63 – 65.

SCH-1 OVERALL WIRING DIAGRAM

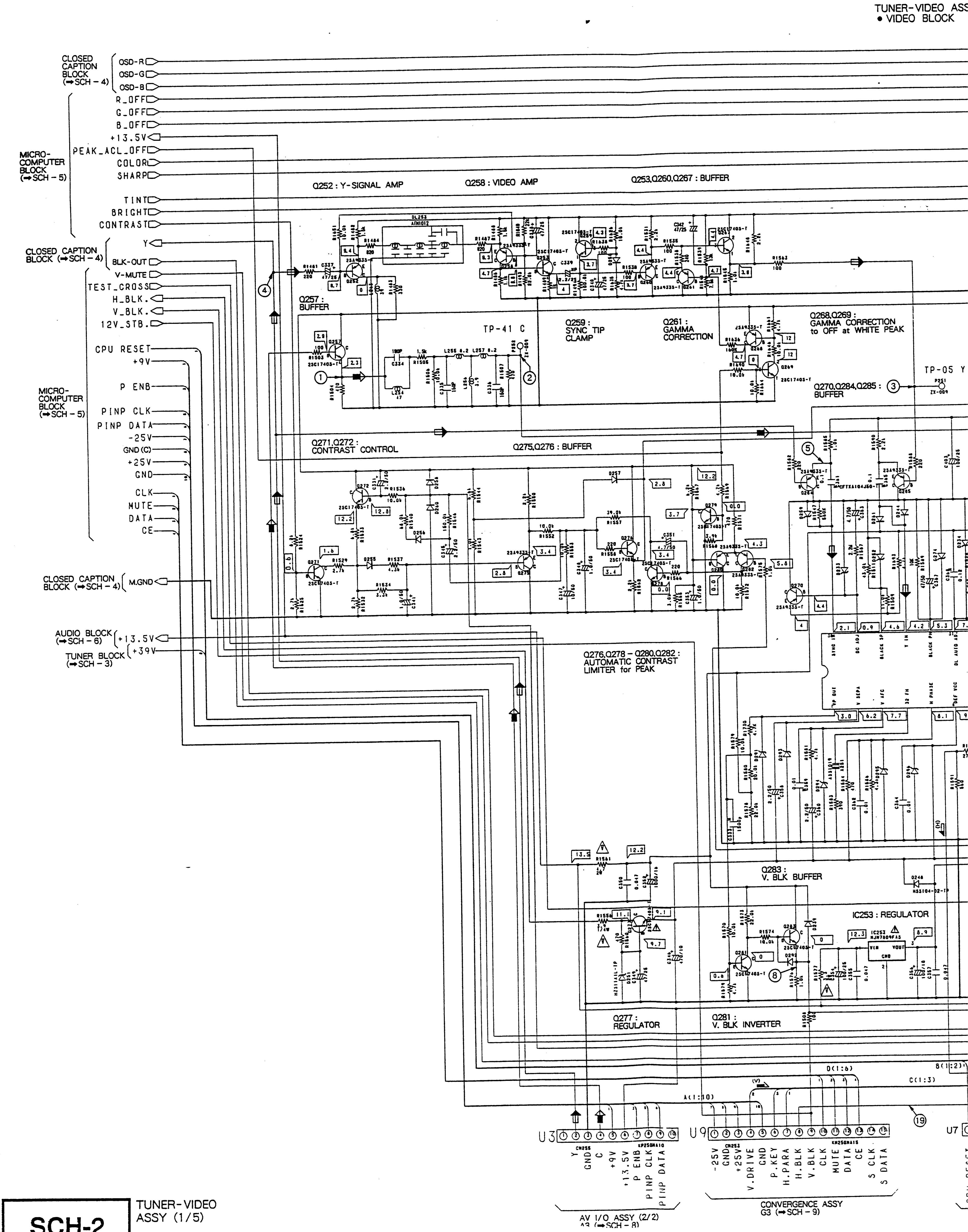

REMOTE CONTROL UNIT
ADX1414
(VHF/UHF)
ANT1 ANT2
AXF1078
J1
J11
△VR1
FOCUS VR
ACX1096
<FOCUS>
<SCREEN>
<FOCUS>
<D.F>
<GND>
R CRT DRIVE
AWZ5968
(➡SCH – 13)
M1
(RED)
< R >
<GND>
<+9V>
SCREEN
J4
M2
J2
J7
V1
RED CRT △☆
GND
J41
J8
N2
G CRT DRIVE
AWZ5969
(➡SCH – 13)
N1
< G >
J5
N3
V2
GREEN CRT △☆
J42
J3
J9
P2
B CRT DRIVE
AWZ5970
(➡SCH – 13)
P1
(BLACK)
< B >
J6
P3
V3
BLUE CRT △☆
J43
U8
<+9V>
J105
<H.T.->
<H.T.+>
<+220V>
J104
<ANODE>
J103
E4
E5
(RED)
△
A.C 120V
60Hz
NEUTRAL
LIVE
J102
J101
FU101
8A 125V
E11
WV1478)
(➡SCH – 2)
K (➡SCH – 3)
TION BLOCK (➡SCH – 4)
TER BLOCK (➡SCH – 5)
(➡SCH – 6)
U6
E6
< +35V >
< A.GND >
<A.C.CLK>
<12V.STB>
< P.GND >
< P.D. >
< RELAY >
< +9V >
< -25V >
< GND >
< V.GND >
< +25V >
☆POWER SUPPLY ASSY
(AWV1496)
• (1/2) : SW POWER SUPPLY BLOCK (➡SCH – 10)
• (2/2) : HIGH VOLTAGE AND DEFLECTION BLOCK (➡SCH – 11)
U7
E7
<CPU RESET>
+39V
P.KEY
V.DRIVE
H.PARA
H.BLK
H.DRIVE
ABL
GND
+13.5V
*1
B CONNECTOR ASSY
(AWZ5976)
*1
A CONNECTOR ASSY
(AWZ5975)
U9
<-25V>
<GND>
<+25V>
<V.DRIVE>
<V GND>
<PIN/KEY>
<H.PARA>
<H.BLK>
<V.BLK>
<CLK>
<MUTE>
<DATA>
<CENB>
<SCLK>
<SDATA>
G3
GND
+5V
CONVERGENCE ASSY
(AWZ5967)
(➡SCH – 9)
G4(RED)
G5
G6(BLACK)
<HR>
<HD>
<VD>
<VR>
R
G
B
E8
E9
<N.C.>
<GND>
<P.KEY>
<H SIZE>
<H Vc.MOD>
<VR152.STR>
<+135V.MOD>
<+13.5V>
<CPU.RESET>
<5.1V>
<+15V>
<IN>
<OUT>
<-15V>
<N.C.>
<P.D(V.AC)>
<V.RETERN>
S1
S2
V – AMP ASSY
(AWZ5973)
(➡SCCH – 12)
E1
(R)
E2
(G)
E3
(B)
<RH>
<RV>
<GH>
<GV>
<BH>
<BV>
VDY
HDY
HCY
VCY
△ATL1086
D.Y
C.Y
L1(R) L2(G) L3(B)

5.2 TUNER-VIDEO ASSY (1/5)

Note :
Diode HSS104-02 and zener diode MTZJ15 unless otherwise noted.

HSS104-02

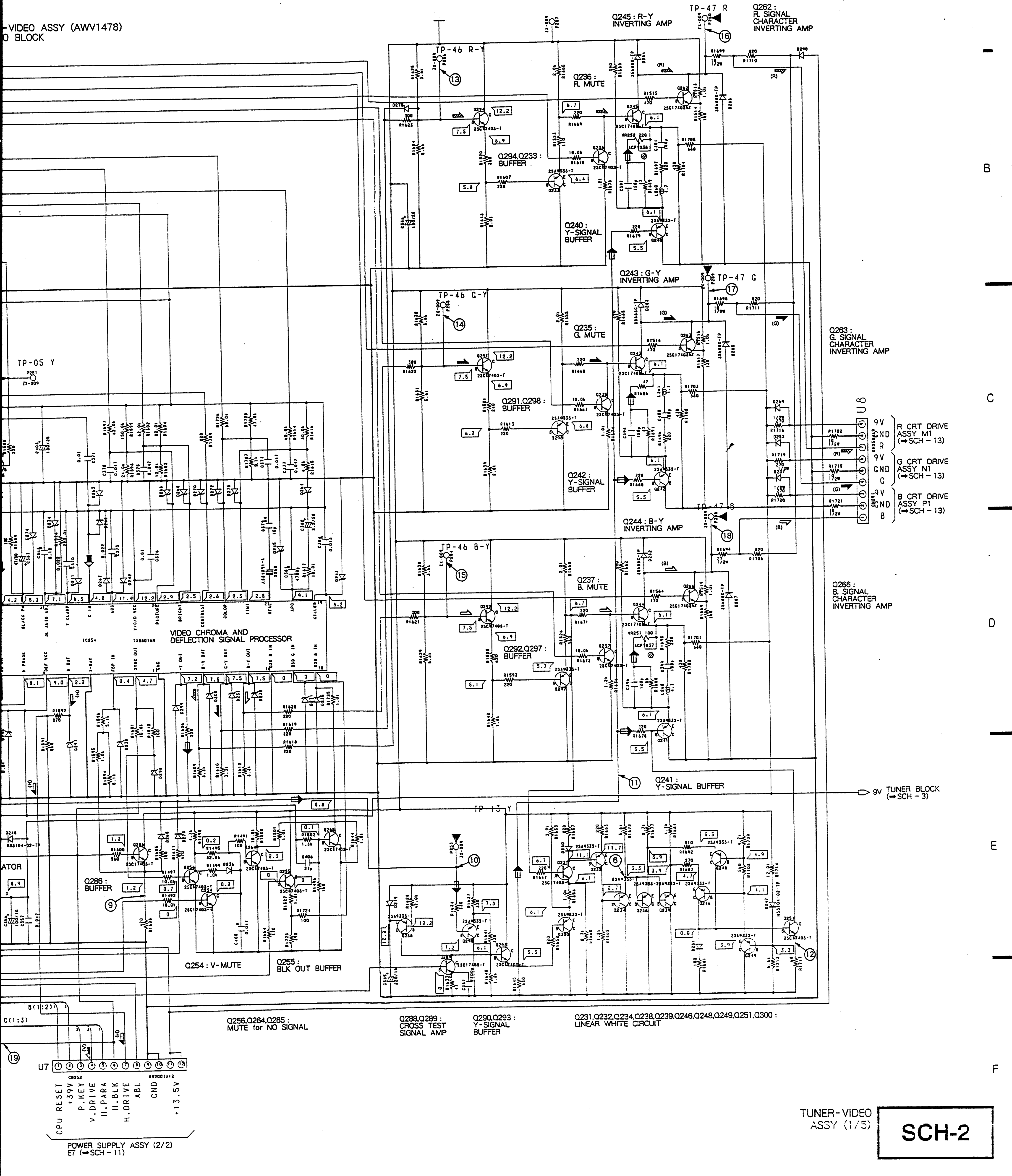
MTZJ15


TUNER-VIDEO ASS
• VIDEO BLOCK
CLOSED CAPTION BLOCK (➡SCH-4)
OSD-R
OSD-G
OSD-B
R_OFF
G_OFF
B_OFF
+13.5V
MICRO-COMPUTER BLOCK (➡SCH-5)
PEAK_ACL_OFF
COLOR
SHARP
TINT
BRIGHT
CONTRAST
CLOSED CAPTION BLOCK (➡SCH-4)
Y
BLK-OUT
V-MUTE
TEST_CROSS
H_BLK.
V_BLK.
12V_STB.
CPU RESET
+9V
P ENB
PINP CLK
PINP DATA
-25V
GND (C)
+25V
GND
CLK
MUTE
DATA
CE
CLOSED CAPTION BLOCK (➡SCH-4)
M.GND
AUDIO BLOCK (➡SCH-6)
+13.5V
TUNER BLOCK (➡SCH-3)
+39V
Q252 : Y-SIGNAL AMP
Q258 : VIDEO AMP
Q253,Q260,Q267 : BUFFER
Q257 : BUFFER
TP-41 C
Q259 : SYNC TIP CLAMP
Q261 : GAMMA CORRECTION
Q268,Q269 : GAMMA CORRECTION to OFF at WHITE PEAK
TP-05 Y
Q270,Q284,Q285 : BUFFER
Q271,Q272 : CONTRAST CONTROL
Q275,Q276 : BUFFER
Q276,Q278 – Q280,Q282 : AUTOMATIC CONTRAST LIMITER for PEAK
Q283 : V. BLK BUFFER
IC253 : REGULATOR
Q277 : REGULATOR
Q281 : V. BLK INVERTER
U3
CN255
Y
GND
C
+9V
+13.5V
P ENB
PINP CLK
PINP DATA
AV I/O ASSY (2/2) A3 (➡SCH-8)
U9
-25V
GND
+25V
V.DRIVE
GND
P.KEY
H.PARA
H.BLK
V.BLK
CLK
MUTE
DATA
CE
S CLK
S DATA
CONVERGENCE ASSY G3 (➡SCH-9)
U7

SCH-2

TUNER-VIDEO ASSY (1/5)

➪ : Y-signal route (Main and sub-pictures)
➡ : C-signal route (Main and sub-pictures)
(H) : H. Deflection signal route
(V) : V. Deflection signal route
▨ : R-Y Signal route
▲ : G-Y Signal route
△ : B-Y Signal route
(R) ▨ : R. Signal route
(G) ▲ : G. Signal route
(B) △ : B. Signal route

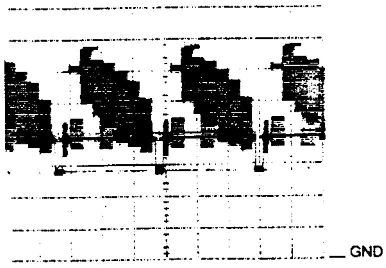

-VIDEO ASSY (AWV1478)
O BLOCK
TP-05 Y
TP-46 R-Y
TP-47 R
TP-46 G-Y
TP-47 G
TP-46 B-Y
TP-47 B
TP-13 Y
Q245 : R-Y INVERTING AMP
Q262 : R. SIGNAL CHARACTER INVERTING AMP
Q236 : R. MUTE
Q294,Q233 : BUFFER
Q240 : Y-SIGNAL BUFFER
Q243 : G-Y INVERTING AMP
Q235 : G. MUTE
Q263 : G. SIGNAL CHARACTER INVERTING AMP
Q291,Q298 : BUFFER
Q242 : Y-SIGNAL BUFFER
Q244 : B-Y INVERTING AMP
Q237 : B. MUTE
Q266 : B. SIGNAL CHARACTER INVERTING AMP
Q292,Q297 : BUFFER
Q241 : Y-SIGNAL BUFFER
U8
9V GND R — R CRT DRIVE ASSY M1 (➡SCH – 13)
9V GND G — G CRT DRIVE ASSY N1 (➡SCH – 13)
9V GND B — B CRT DRIVE ASSY P1 (➡SCH – 13)
9V TUNER BLOCK (➡SCH – 3)
IC254 TA8801AN
VIDEO CHROMA AND DEFLECTION SIGNAL PROCESSOR
BLACK PK
DL AUTO ADJ
Y CLAMP
C IN
ACC
V/C/D VCC
PICTURE
BRIGHT
CONTRAST
COLOR
TINT
XTAL
APC
KILLER
H PHASE
DEF VCC
H OUT
X-RAY
FBP IN
SYNC OUT
GND
-Y OUT
R-Y OUT
G-Y OUT
B-Y OUT
OSD R IN
OSD G IN
OSD B IN
ATOR
Q286 : BUFFER
Q254 : V-MUTE
Q255 : BLK OUT BUFFER
Q256,Q264,Q265 : MUTE for NO SIGNAL
Q288,Q289 : CROSS TEST SIGNAL AMP
Q290,Q293 : Y-SIGNAL BUFFER
Q231,Q232,Q234,Q238,Q239,Q246,Q248,Q249,Q251,Q300 : LINEAR WHITE CIRCUIT
B(1:2)
C(1:3)
U7
CN252
KM200IA12
CPU RESET
+39V
P.KEY
V.DRIVE
H.PARA
H.BLK
H.DRIVE
ABL
GND
+13.5V
POWER SUPPLY ASSY (2/2) E7 (➡SCH – 11)
5
6
7
8
9
B
C
D
E
F

TUNER-VIDEO ASSY (1/5)

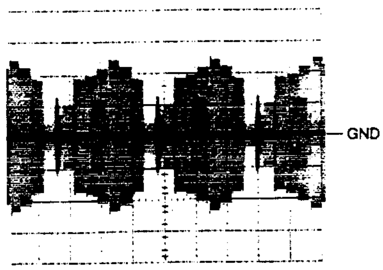
• Waveformes at TUNER–VIDEO assembly

- Input signal : Color bar
- Picture quality : standard
- Range : DC range (Unless otherwise noted.)

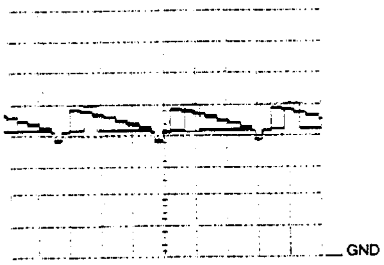
① **Q257 Emitter (Before C. BPF)**
V range : 0.5V/div.
H range : 20 μsec/div.



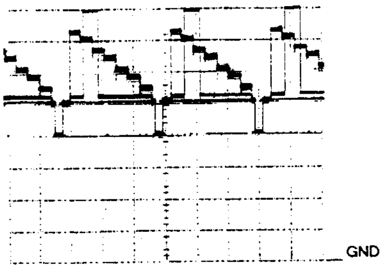
② **TP-41 (C)**
V range : 50mV/div.
H range : 20 μsec/div.



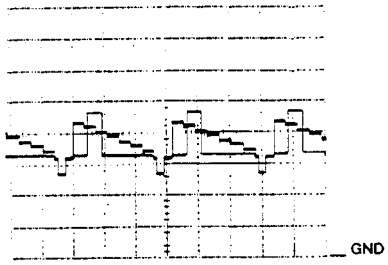
③ **TP-05 (Y)**
V range : 1V/div.
H range : 20 μsec/div.



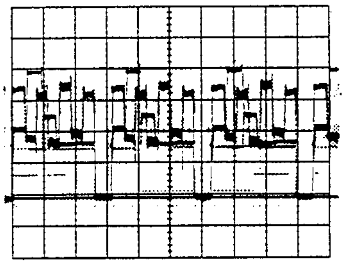
④ **U3 pin Y**
V range : 0.5V/div.
H range : 20 μsec/div.



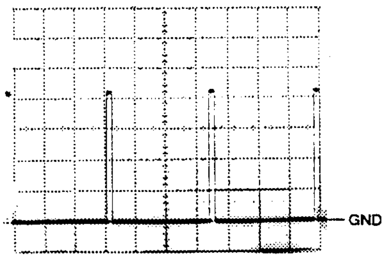
⑤ **Q284 Emitter (Sync Y in)**
V range : 1V/div.
H range : 20 μsec/div.



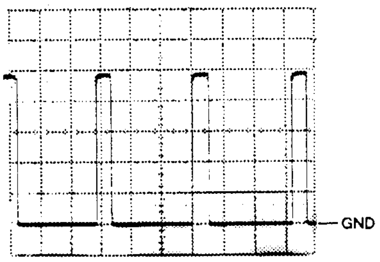
⑥ **Q234 Emitter**
V range : 1V/div.
H range : 20 μsec/div.



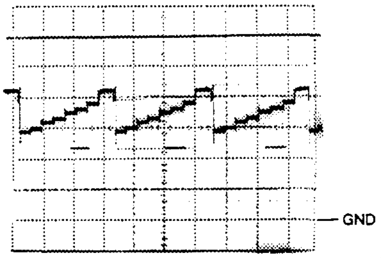
⑧ **Q283 Emitter**
V range : 2V/div.
H range : 5msec/div.



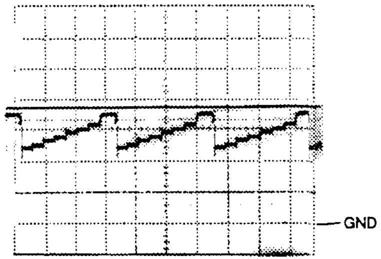
⑨ **Q286 Emitter**
V range : 2V/div.
H range : 20 μsec/div.



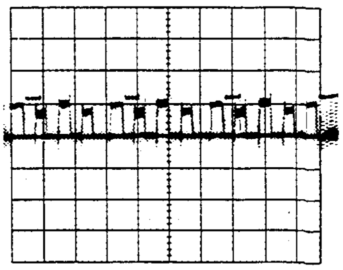
⑩ **TP-13**
V range : 2V/div.
H range : 20 μsec/div.



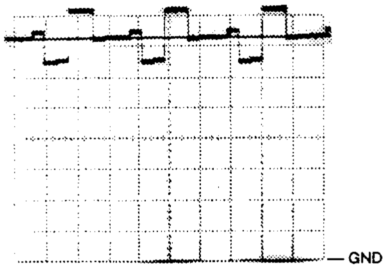
⑪ **Q293 Emitter**
V range : 2V/div.
H range : 20 μsec/div.



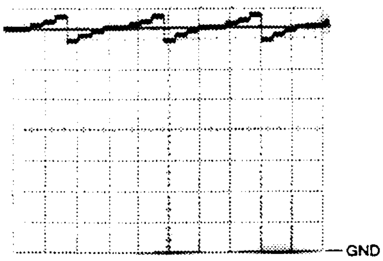
⑫ **Q251 Emitter**
V range : 0.2V/div.
H range : 20 μsec/div.



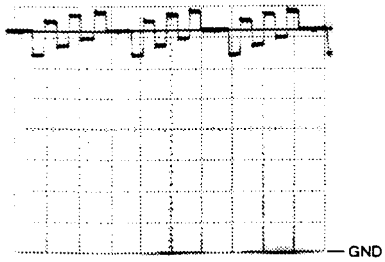
⑬ **TP-46 (R-Y)**
V range : 1V/div.
H range : 20 μsec/div.



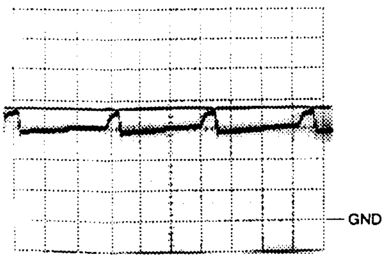
⑭ **TP-46(G-Y)**
V range : 1V/div.
H range : 20 μsec/div.



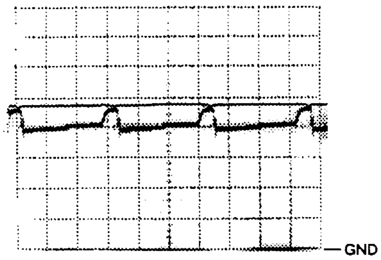
⑮ **TP-46 (B-Y)**
V range : 1V/div.
H range : 20 μsec/div.



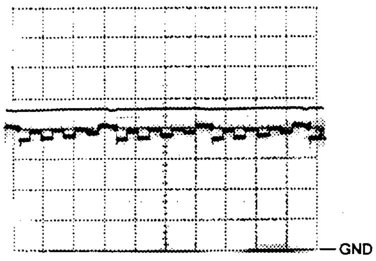
⑯ **TP-47 (R)**
V range : 2V/div.
H range : 20 μsec/div.



⑰ **TP-47 (G)**
V range : 2V/div.
H range : 20 μsec/div.



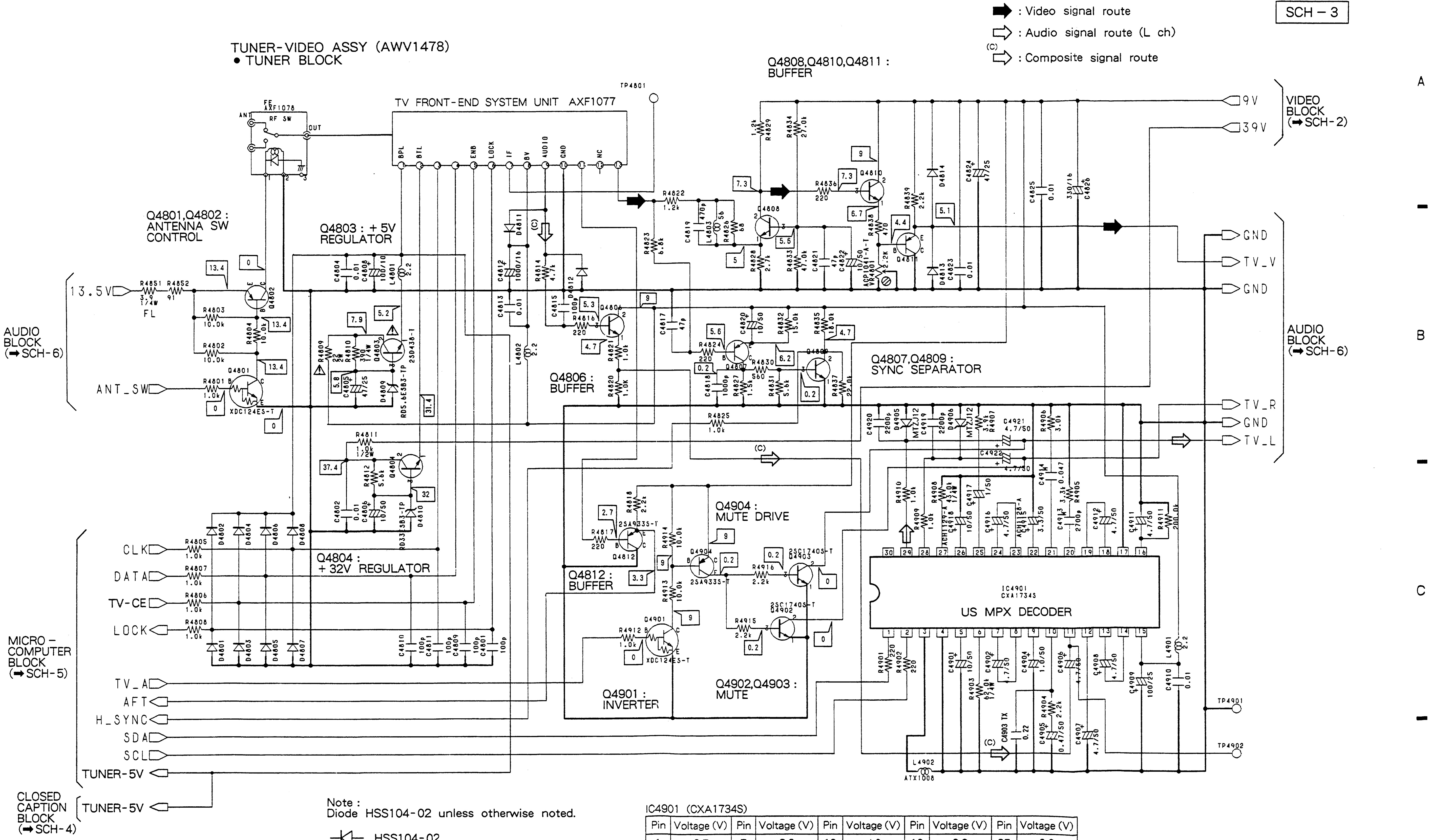
⑱ **TP-47 (B)**
V range : 2V/div.
H range : 20 μsec/div.



⑲

Note :
No. ⑲ waveform is indicated
in SCH-13.

5.3 TUNER- VIDEO ASSY (2/5)


: Video signal route
: Audio signal route (L ch)
(C) : Composite signal route
TUNER-VIDEO ASSY (AWV1478)
• TUNER BLOCK
TV FRONT-END SYSTEM UNIT AXF1077
FE AXF1078
ANT
RF SW
OUT
BPL
BTL
ENB
LOCK
IF
BV
AUDIO
GND
NC
TP4801
Q4808,Q4810,Q4811 : BUFFER
Q4801,Q4802 : ANTENNA SW CONTROL
Q4803 : +5V REGULATOR
Q4806 : BUFFER
Q4807,Q4809 : SYNC SEPARATOR
Q4804 : +32V REGULATOR
Q4812 : BUFFER
Q4904 : MUTE DRIVE
Q4901 : INVERTER
Q4902,Q4903 : MUTE
IC4901 CXA1734S
US MPX DECODER
13.5V
ANT_SW
AUDIO BLOCK (➡SCH-6)
CLK
DATA
TV-CE
LOCK
TV_A
AFT
H_SYNC
SDA
SCL
TUNER-5V
MICRO-COMPUTER BLOCK (➡SCH-5)
CLOSED CAPTION BLOCK (➡SCH-4)
TUNER-5V
9V
39V
VIDEO BLOCK (➡SCH-2)
GND
TV_V
GND
TV_R
GND
TV_L
AUDIO BLOCK (➡SCH-6)
TP4901
TP4902
L4902 ATX1008
XDC124ES-T
2SA933S-T
2SC1740S-T
2SD438-T
RD5.6ES83-TP
RD33ES83-TP

Note :
Diode HSS104-02 unless otherwise noted.

HSS104-02

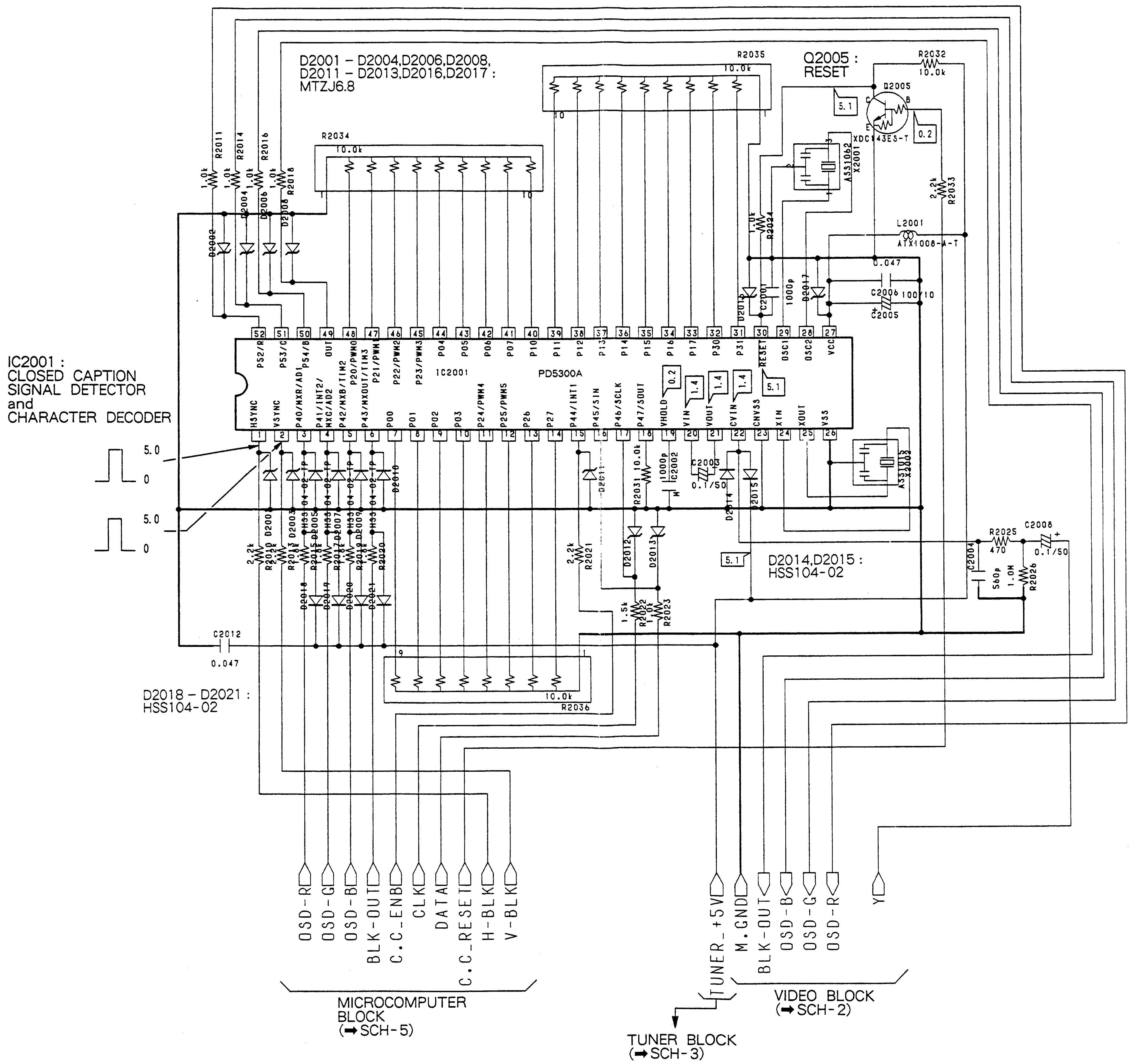
IC4901 (CXA1734S)

Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)
1	3.7	7	3.9	13	4.0	19	3.9	25	3.9
2	4.2	8	4.0	14	3.9	20	3.9	26	2.0
3	0	9	5.6	15	9.0	21	4.0	27	1.2
4	0	10	4.9	16	4.1	22	2.0	28	4.0
5	1.2	11	3.9	17	0	23	4.0	29	4.0
6	1.2	12	3.0	18	4.0	24	4.0	30	—

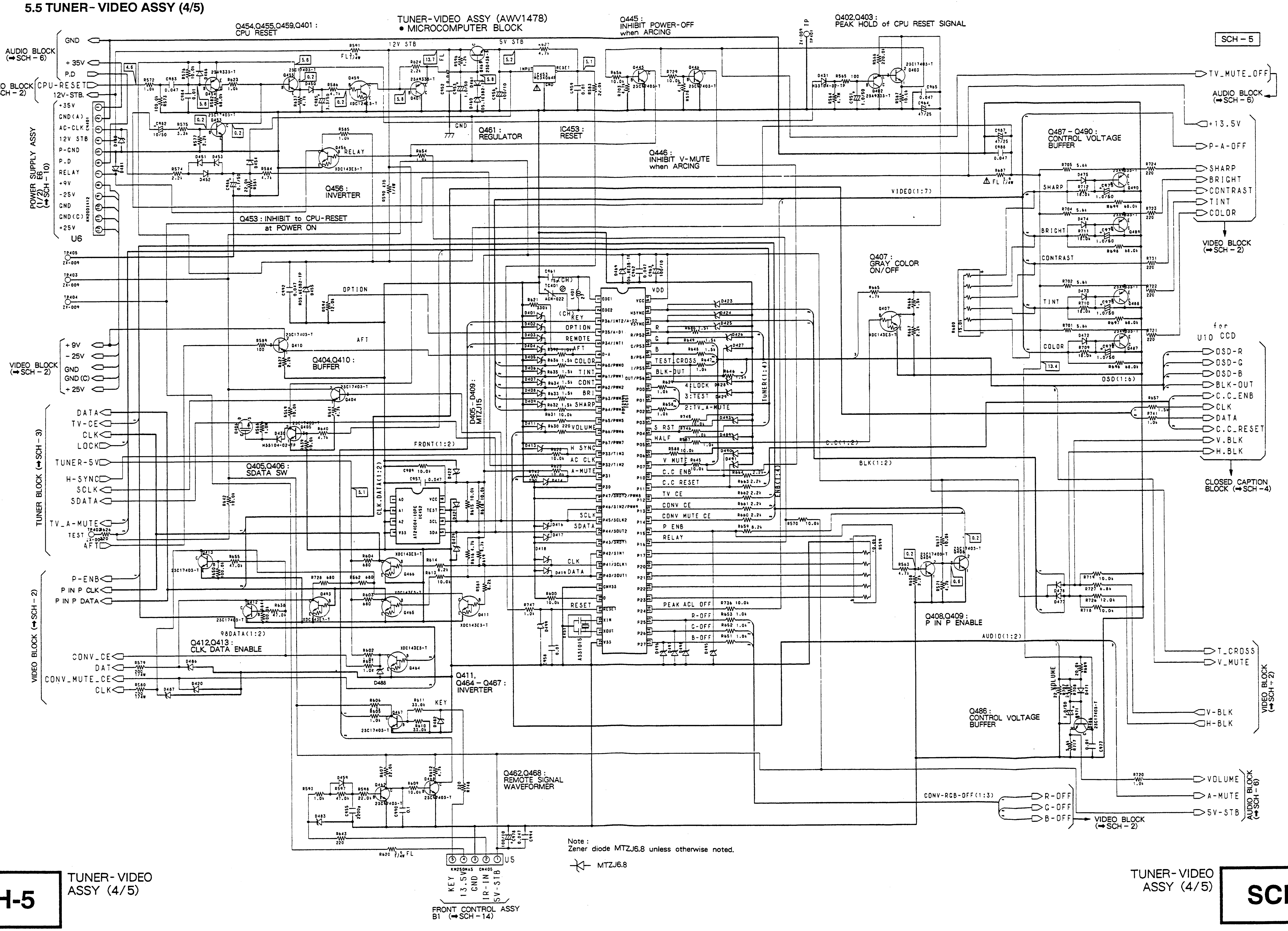
5.4 TUNER- VIDEO ASSY (3/5)

SCH – 4

TUNER- VIDEO ASSY (AWV1478) ● CLOSED CAPTION BLOCK


D2001 – D2004,D2006,D2008,
D2011 – D2013,D2016,D2017 :
MTZJ6.8
Q2005 :
RESET
IC2001 :
CLOSED CAPTION
SIGNAL DETECTOR
and
CHARACTER DECODER
IC2001
PD5300A
D2014,D2015 :
HSS104-02
D2018 – D2021 :
HSS104-02
R2034 10.0k
R2035 10.0k
R2036 10.0k
R2032 10.0k
R2033 2.2k
R2011 1.0k
R2014 1.0k
R2016 1.0k
R2018 1.0k
R2024 1.0k
R2025 470
R2026 1.0M
R2031 10.0k
R2021 2.2k
R2022 1.5k
R2023 1.0k
C2001 1000p
C2002 1000p
C2003 0.1/50
C2004 560p
C2005 100/10
C2006 0.047
C2008 0.1/50
C2012 0.047
L2001 ATX1008-A-T
X2001 ASS1062
X2002 ASS1013
XDC143ES-T
5.0
0
5.1
0.2
1.4
HSYNC
VSYNC
PS2/R
PS3/G
PS4/B
OUT
RESET
OSC1
OSC2
VCC
XIN
XOUT
VSS
VHOLD
VIN
VOUT
CVIN
CNV33
OSD-R
OSD-G
OSD-B
BLK-OUT
C.C_ENB
CLK
DATA
C.C_RESET
H-BLK
V-BLK
TUNER_+5V
M.GND
BLK-OUT
OSD-B
OSD-G
OSD-R
Y
MICROCOMPUTER
BLOCK
(➡SCH-5)
TUNER BLOCK
(➡SCH-3)
VIDEO BLOCK
(➡SCH-2)

5.5 TUNER- VIDEO ASSY (4/5)


SCH – 5
TUNER-VIDEO ASSY (AWV1478)
• MICROCOMPUTER BLOCK
Q454,Q455,Q459,Q401 : CPU RESET
Q445 : INHIBIT POWER-OFF when ARCING
Q402,Q403 : PEAK HOLD of CPU RESET SIGNAL
Q461 : REGULATOR
IC453 : RESET
Q446 : INHIBIT V-MUTE when ARCING
Q456 : INVERTER
Q453 : INHIBIT to CPU-RESET at POWER ON
Q487 – Q490 : CONTROL VOLTAGE BUFFER
Q407 : GRAY COLOR ON/OFF
Q404,Q410 : BUFFER
Q405,Q406 : SDATA SW
D405 – D409 : MTZJ15
Q412,Q413 : CLK, DATA ENABLE
Q411, Q464 – Q467 : INVERTER
Q408,Q409 : P IN P ENABLE
Q486 : CONTROL VOLTAGE BUFFER
Q462,Q468 : REMOTE SIGNAL WAVEFORMER
AUDIO BLOCK (➡SCH – 6)
VIDEO BLOCK (➡SCH – 2)
POWER SUPPLY ASSY (1/2) E6 (➡SCH – 10)
U6
GND
+35V
P.D
CPU-RESET
12V-STB.
+35V
GND(A)
AC-CLK
12V STB
P-GND
P.D
RELAY
+9V
-25V
GND
GND(C)
+25V
+9V
– 25V
GND
GND (C)
+ 25V
TUNER BLOCK (➡SCH – 3)
DATA
TV-CE
CLK
LOCK
TUNER-5V
H-SYNC
SCLK
SDATA
TV_A-MUTE
TEST
AFT
VIDEO BLOCK (➡SCH – 2)
P-ENB
P IN P CLK
P IN P DATA
CONV_CE
DAT
CONV_MUTE_CE
CLK
OPTION
AFT
FRONT(1:2)
VIDEO(1:7)
BLK(1:2)
C.C(1:2)
AUDIO(1:2)
98DATA(1:2)
CLK.DATA(1:2)
CONV-RGB-OFF(1:3)
OSD(1:6)
TUNER(1:4)
ENB(1:4)
SHARP
BRIGHT
CONTRAST
TINT
COLOR
VOLUME
KEY
VDD
OPTION
REMOTE
AFT
COLOR
TINT
CONT
BRI
SHARP
VOLUME
H SYNC
AC CLK
A-MUTE
SCLK
SDATA
CLK
DATA
RESET
R
G
B
TEST CROSS
BLK-OUT
4:LOCK
3:TEST
2:TV-A-MUTE
S RST
HALF
V MUTE
C.C ENB
C.C RESET
TV CE
CONV CE
CONV MUTE CE
P ENB
RELAY
PEAK ACL OFF
R-OFF
G-OFF
B-OFF
TV_MUTE_OFF
AUDIO BLOCK (➡SCH – 6)
+13.5V
P-A-OFF
SHARP
BRIGHT
CONTRAST
TINT
COLOR
VIDEO BLOCK (➡SCH – 2)
for U10 CCD
OSD-R
OSD-G
OSD-B
BLK-OUT
C.C_ENB
CLK
DATA
C.C_RESET
V.BLK
H.BLK
CLOSED CAPTION BLOCK (➡SCH – 4)
T_CROSS
V_MUTE
VIDEO BLOCK (➡SCH – 2)
V-BLK
H-BLK
VOLUME
A-MUTE
5V-STB
AUDIO BLOCK (➡SCH – 6)
R-OFF
G-OFF
B-OFF
VIDEO BLOCK (➡SCH – 2)
US
KEY
13.5V
GND
IR-IN
5V-STB
FRONT CONTROL ASSY B1 (➡SCH – 14)
12V STB
5V STB
FL
TP

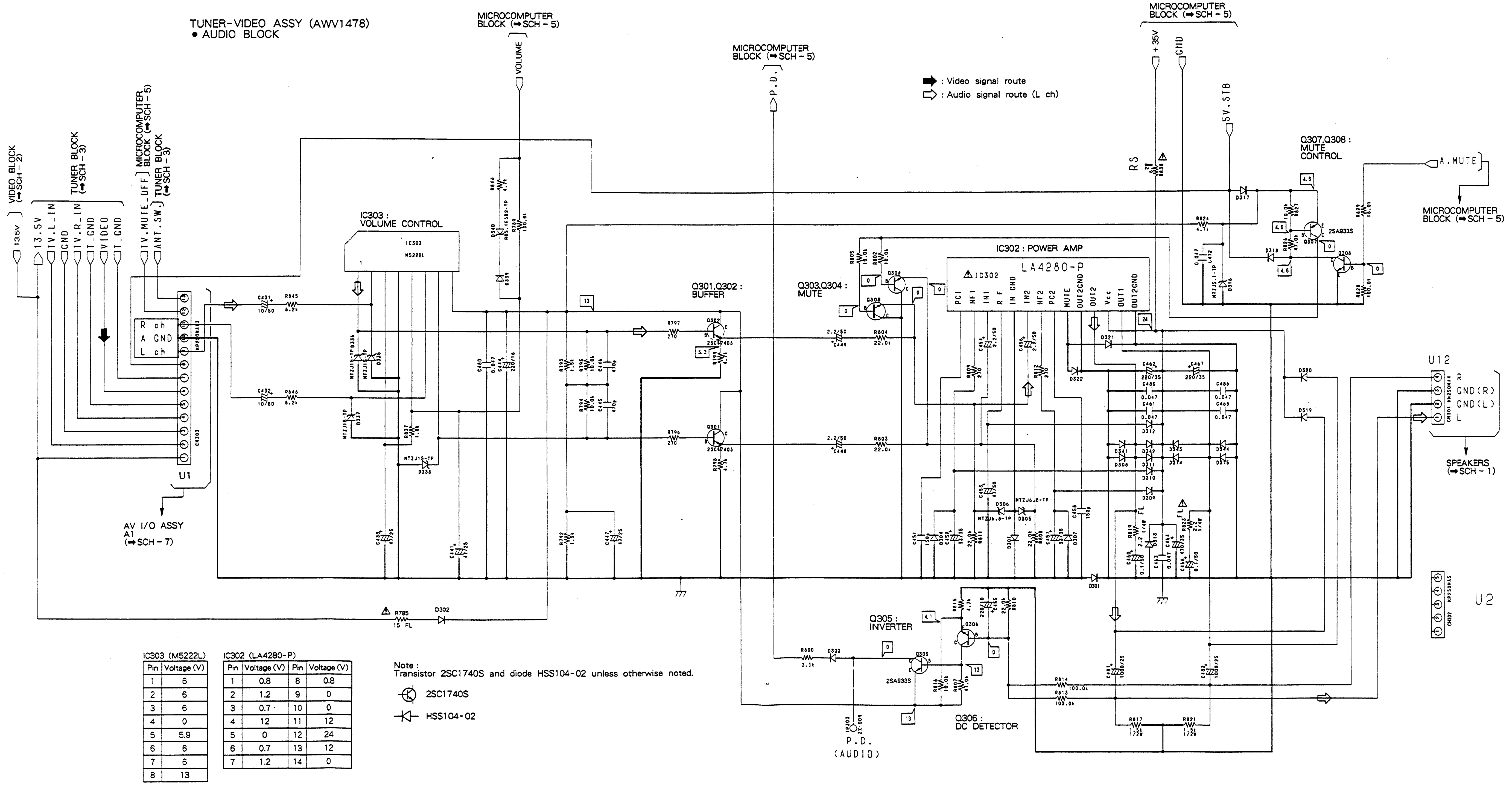
Note :
Zener diode MTZJ6.8 unless otherwise noted.

MTZJ6.8

SCH-5 TUNER- VIDEO ASSY (4/5)

TUNER- VIDEO ASSY (4/5) **SCH-5**

5.6 TUNER- VIDEO ASSY (5/5)


TUNER-VIDEO ASSY (AWV1478)
• AUDIO BLOCK
MICROCOMPUTER BLOCK (➡SCH – 5)
VOLUME
P.D.
➡ : Video signal route
⇨ : Audio signal route (L ch)
+35V
GND
5V.STB
RS
A.MUTE
Q307,Q308 : MUTE CONTROL
2SA933S
VIDEO BLOCK (➡SCH – 2)
TUNER BLOCK (➡SCH – 3)
13.5V
TV.L.IN
GND
TV.R.IN
T.GND
VIDEO
T.GND
TV.MUTE_OFF
ANT.SW.
R ch
A GND
L ch
U1
AV I/O ASSY A1 (➡SCH – 7)
IC303 : VOLUME CONTROL
M5222L
Q301,Q302 : BUFFER
2SC1740S
Q303,Q304 : MUTE
IC302 : POWER AMP
LA4280-P
PC1
NF1
IN1
RF
IN GND
IN2
NF2
PC2
MUTE
OUT2GND
OUT2
Vcc
OUT1
OUT2GND
U12
R
GND(R)
GND(L)
L
SPEAKERS (➡SCH – 1)
U2
R785 15 FL
D302
Q305 : INVERTER
Q306 : DC DETECTOR
2SA933S
P.D. (AUDIO)

IC303 (M5222L)

Pin	Voltage (V)
1	6
2	6
3	6
4	0
5	5.9
6	6
7	6
8	13

IC302 (LA4280-P)

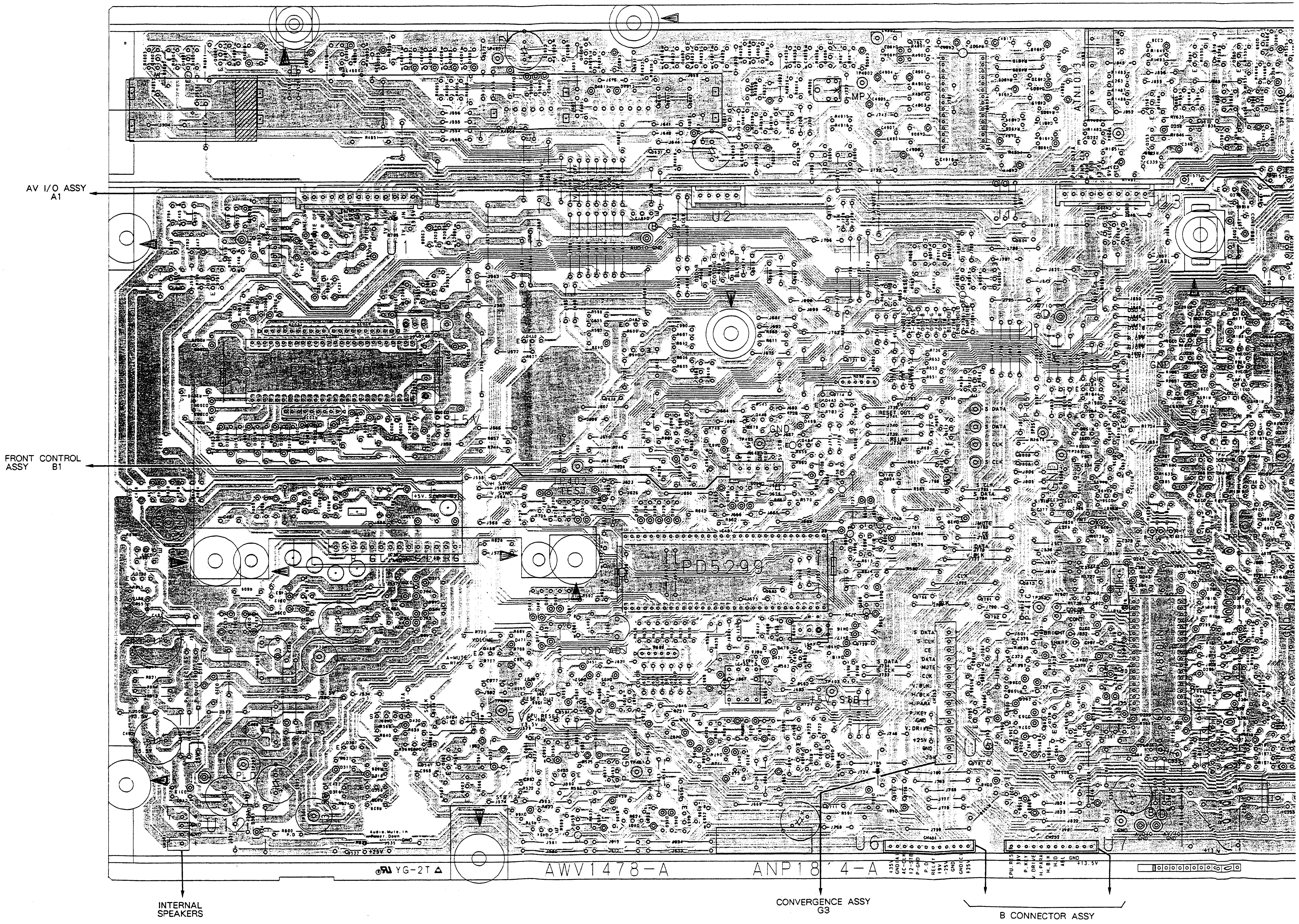
Pin	Voltage (V)	Pin	Voltage (V)
1	0.8	8	0.8
2	1.2	9	0
3	0.7	10	0
4	12	11	12
5	0	12	24
6	0.7	13	12
7	1.2	14	0

Note :
Transistor 2SC1740S and diode HSS104-02 unless otherwise noted.

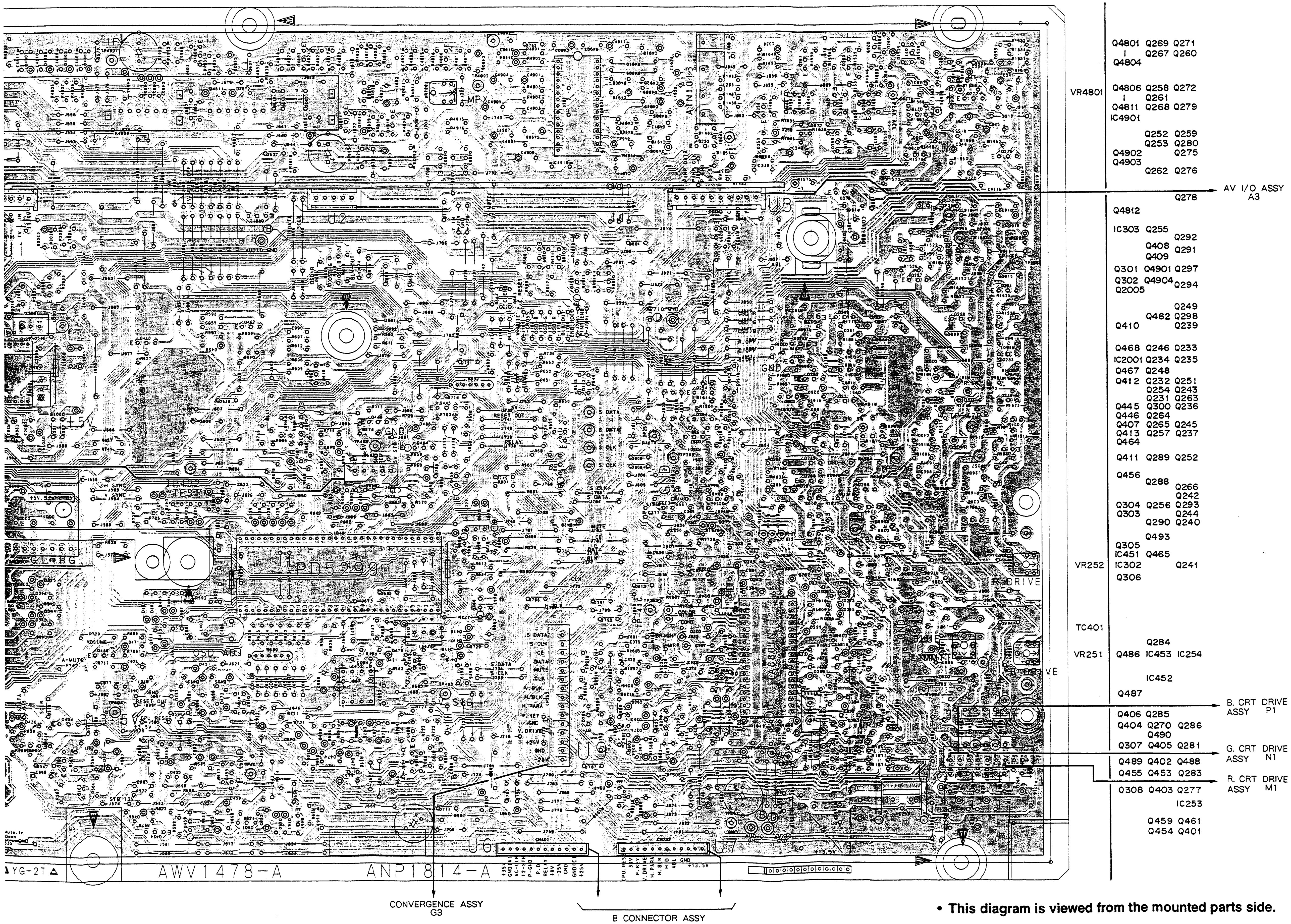
2SC1740S

HSS104-02

TUNER- VIDEO ASSY

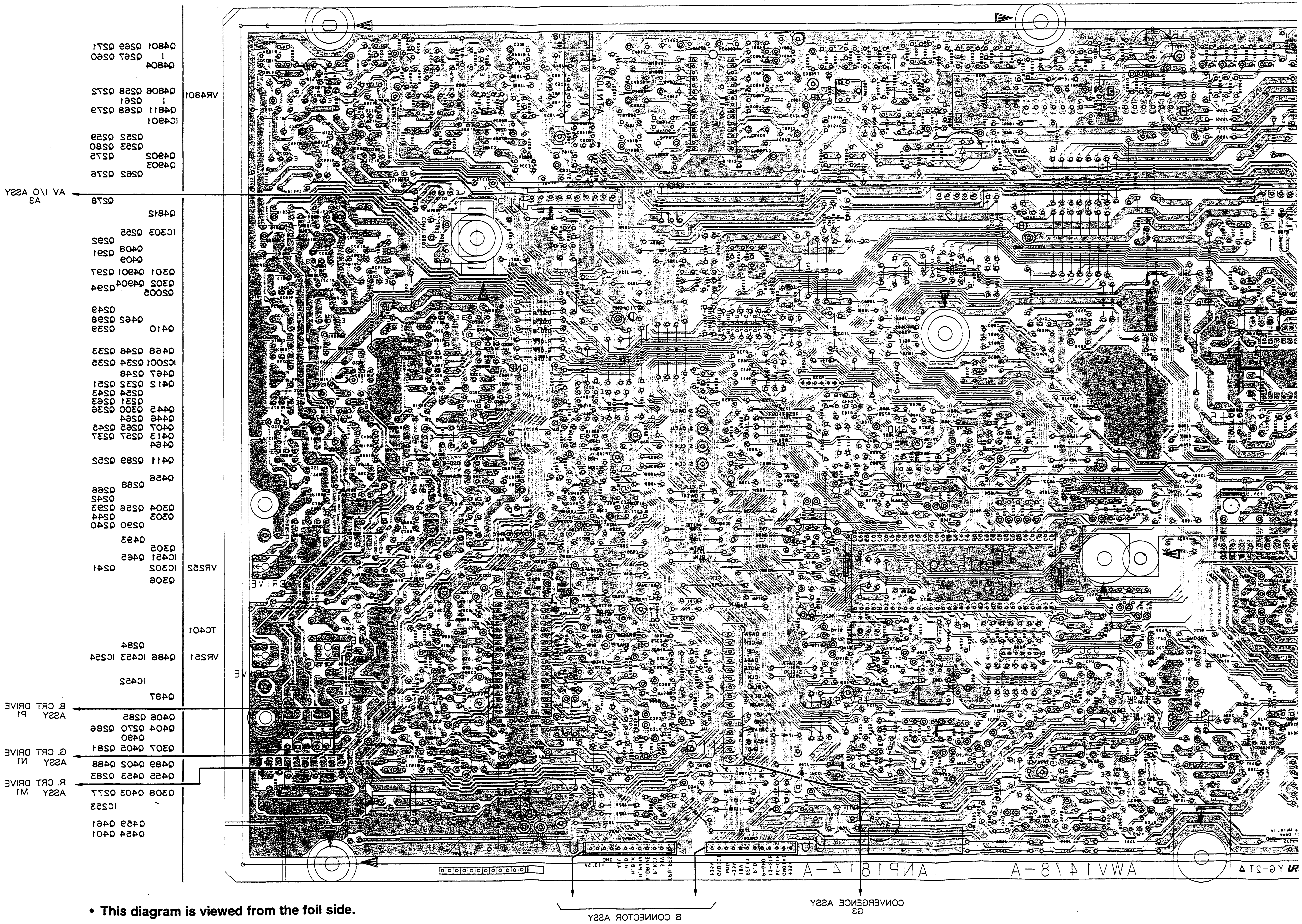

AV I/O ASSY
A1
FRONT CONTROL
ASSY B1
INTERNAL
SPEAKERS
CONVERGENCE ASSY
G3
B CONNECTOR ASSY
PD5510
PD5299
U2
U3
U6
U7
MPX
TEST
+5V
GND
OSD ADJ
VOLUME
A-MUTE
S DATA
S CLK
CE
DATA
MUTE
CLK
+25V
YG-2T
AWV1478-A
ANP18´4-A

PCB – 1


U2
U3
MPX
AIN10
TEST
PD5299
OSD ADJ
DRIVE
B DRIVE
GND
U6
U7
AWV1478-A
ANP1814-A
YG-2T
VR4801
Q4801 Q269 Q271
Q267 Q260
Q4804
Q4806 Q258 Q272
Q261
Q4811 Q268 Q279
IC4901
Q252 Q259
Q253 Q280
Q4902 Q275
Q4903
Q262 Q276
Q278
AV I/O ASSY
A3
Q4812
IC303 Q255
Q292
Q408 Q291
Q409
Q301 Q4901 Q297
Q302 Q4904 Q294
Q2005
Q249
Q462 Q298
Q410 Q239
Q468 Q246 Q233
IC2001 Q234 Q235
Q467 Q248
Q412 Q232 Q251
Q254 Q243
Q231 Q263
Q445 Q300 Q236
Q446 Q264
Q407 Q265 Q245
Q413 Q257 Q237
Q464
Q411 Q289 Q252
Q456
Q288
Q266
Q242
Q304 Q256 Q293
Q303 Q244
Q290 Q240
Q493
Q305
IC451 Q465
VR252
IC302 Q241
Q306
TC401
Q284
VR251
Q486 IC453 IC254
IC452
Q487
B. CRT DRIVE
ASSY P1
Q406 Q285
Q404 Q270 Q286
Q490
Q307 Q405 Q281
G. CRT DRIVE
ASSY N1
Q489 Q402 Q488
Q455 Q453 Q283
R. CRT DRIVE
ASSY M1
Q308 Q403 Q277
IC253
Q459 Q461
Q454 Q401
CONVERGENCE ASSY
G3
B CONNECTOR ASSY
A
B
C
D

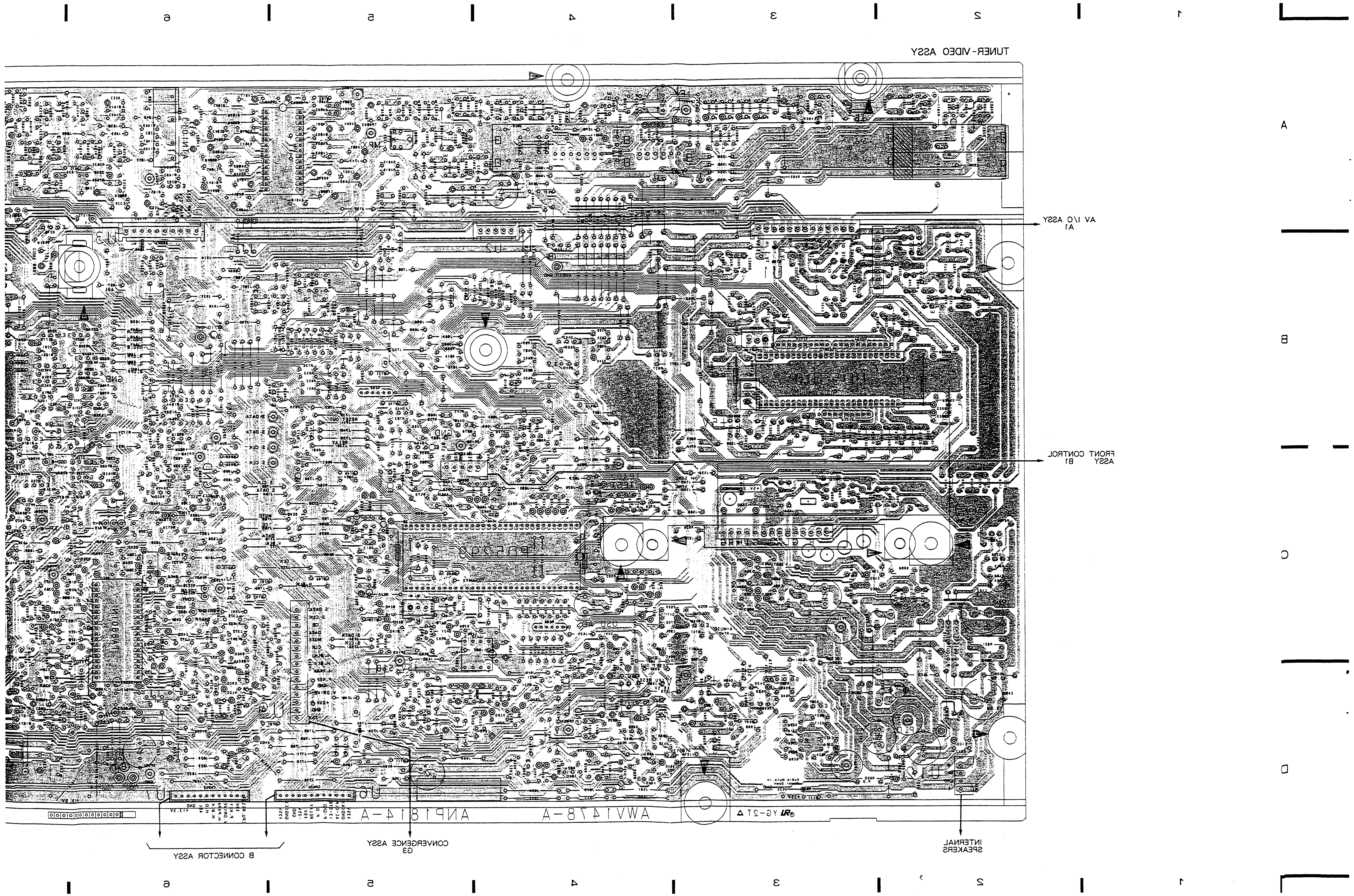
• **This diagram is viewed from the mounted parts side.**

PCB – 1


8
7
6
5
4
3
A
B
C
D
VR4801
Q4801 Q269 Q271
– Q267 Q260
Q4804
Q4806 Q258 Q272
– Q261
Q4811 Q268 Q279
IC4901
Q252 Q259
Q253 Q280
Q4902 Q275
Q4903
Q262 Q276
AV I/O ASSY
A3
Q278
Q4812
IC303 Q255
Q292
Q408 Q291
Q409
Q301 Q4901 Q297
Q302 Q4904 Q294
Q2005
Q249
Q462 Q298
Q410 Q239
Q468 Q246 Q233
IC2001 Q234 Q235
Q467 Q248
Q412 Q232 Q251
Q254 Q243
Q231 Q263
Q445 Q300 Q236
Q446 Q264
Q407 Q265 Q245
Q413 Q257 Q237
Q464
Q411 Q289 Q252
Q456
Q288
Q266
Q242
Q304 Q256 Q293
Q303 Q244
Q290 Q240
Q493
Q305
IC451 Q465
VR252
IC302 Q241
Q306
TC401
Q284
VR251
Q486 IC453 IC254
IC452
Q487
B. CRT DRIVE
ASSY P1
Q406 Q285
Q404 Q270 Q286
Q490
Q307 Q405 Q281
G. CRT DRIVE
ASSY N1
Q489 Q402 Q488
Q455 Q453 Q283
R. CRT DRIVE
ASSY M1
Q308 Q403 Q277
IC253
Q459 Q461
Q454 Q401
ANP1814-A
AWV1478-A
B CONNECTOR ASSY
CONVERGENCE ASSY
G3
9
8
7
6
5
4
3

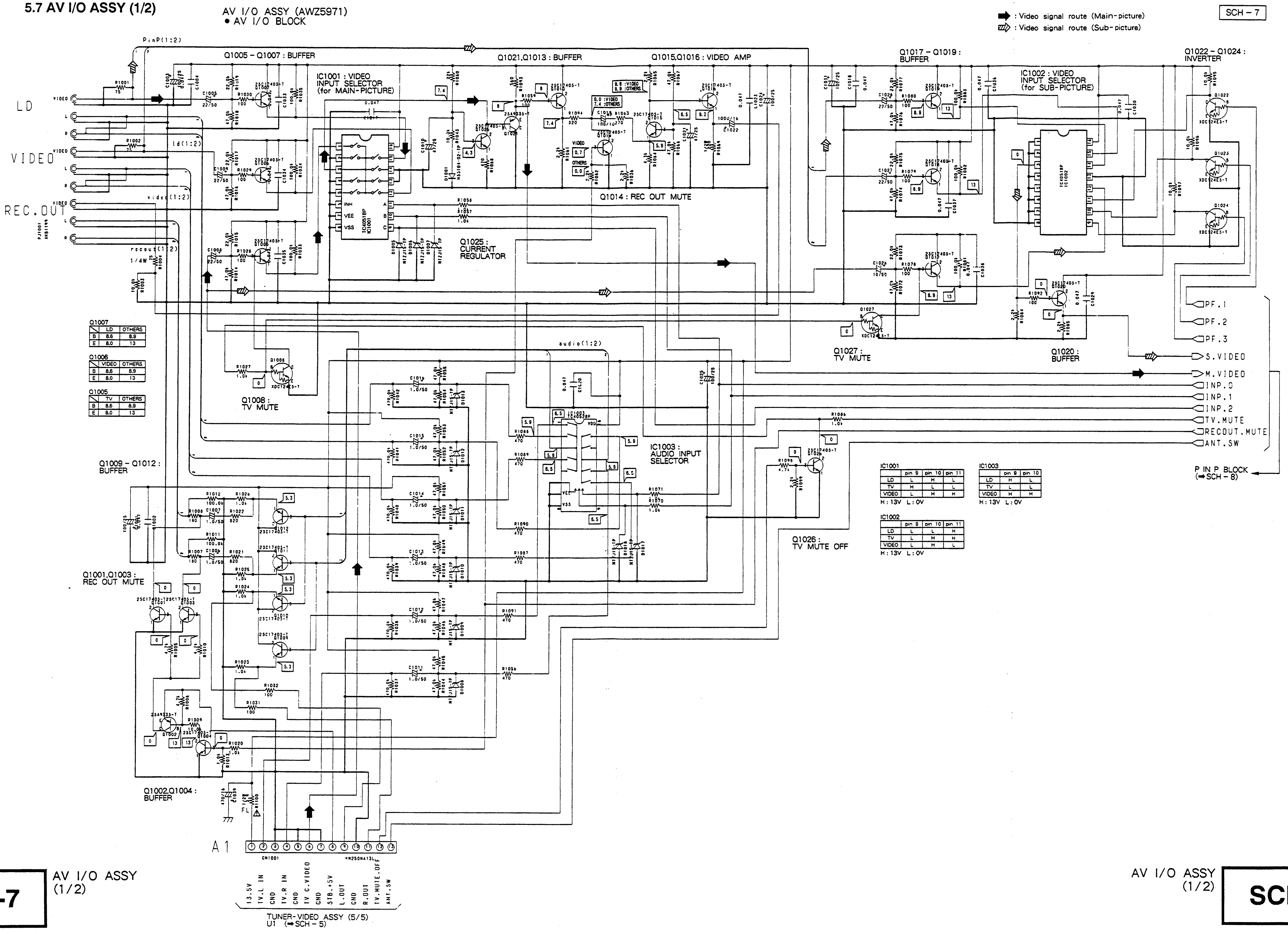
• This diagram is viewed from the foil side.

TUNER-VIDEO ASSY


6
5
4
3
2
1
A
B
C
D
AV I/O ASSY
A1
FRONT CONTROL
ASSY B1
INTERNAL
SPEAKERS
CONVERGENCE ASSY
G3
B CONNECTOR ASSY
ANP1814-A
AWV1478-A
YG-27

5.7 AV I/O ASSY (1/2)

SCH – 7


AV I/O ASSY (AWZ5971)
• AV I/O BLOCK
➡ : Video signal route (Main-picture)
▨ : Video signal route (Sub-picture)
PinP(1:2)
Q1005 – Q1007 : BUFFER
IC1001 : VIDEO INPUT SELECTOR (for MAIN-PICTURE)
Q1021,Q1013 : BUFFER
Q1015,Q1016 : VIDEO AMP
Q1014 : REC OUT MUTE
Q1017 – Q1019 : BUFFER
IC1002 : VIDEO INPUT SELECTOR (for SUB-PICTURE)
Q1022 – Q1024 : INVERTER
LD
VIDEO
REC.OUT
ld(1:2)
video(1:2)
recout(1:2)
Q1025 : CURRENT REGULATOR
Q1027 : TV MUTE
Q1020 : BUFFER
PF.1
PF.2
PF.3
S.VIDEO
M.VIDEO
INP.0
INP.1
INP.2
TV.MUTE
RECOUT.MUTE
ANT.SW
P IN P BLOCK (➡SCH – 8)
audio(1:2)
Q1008 : TV MUTE
IC1003 : AUDIO INPUT SELECTOR
Q1026 : TV MUTE OFF
Q1009 – Q1012 : BUFFER
Q1001,Q1003 : REC OUT MUTE
Q1002,Q1004 : BUFFER
A1
CN1001
KM250NA13L
13.5V
TV.L IN
GND
TV.R IN
GND
TV C.VIDEO
GND
STB.+5V
L.OUT
GND
R.OUT
TV.MUTE.OFF
ANT.SW
TUNER-VIDEO ASSY (5/5)
U1 (➡SCH – 5)

Q1007

	LD	OTHERS
B	8.6	8.9
E	8.0	13

Q1006

	VIDEO	OTHERS
B	8.6	8.9
E	8.0	13

Q1005

	TV	OTHERS
B	8.6	8.9
E	8.0	13

IC1001

	pin 9	pin 10	pin 11
LD	L	H	L
TV	H	L	L
VIDEO	L	H	H

H : 13V L : 0V

IC1003

	pin 9	pin 10
LD	H	L
TV	L	L
VIDEO	H	H

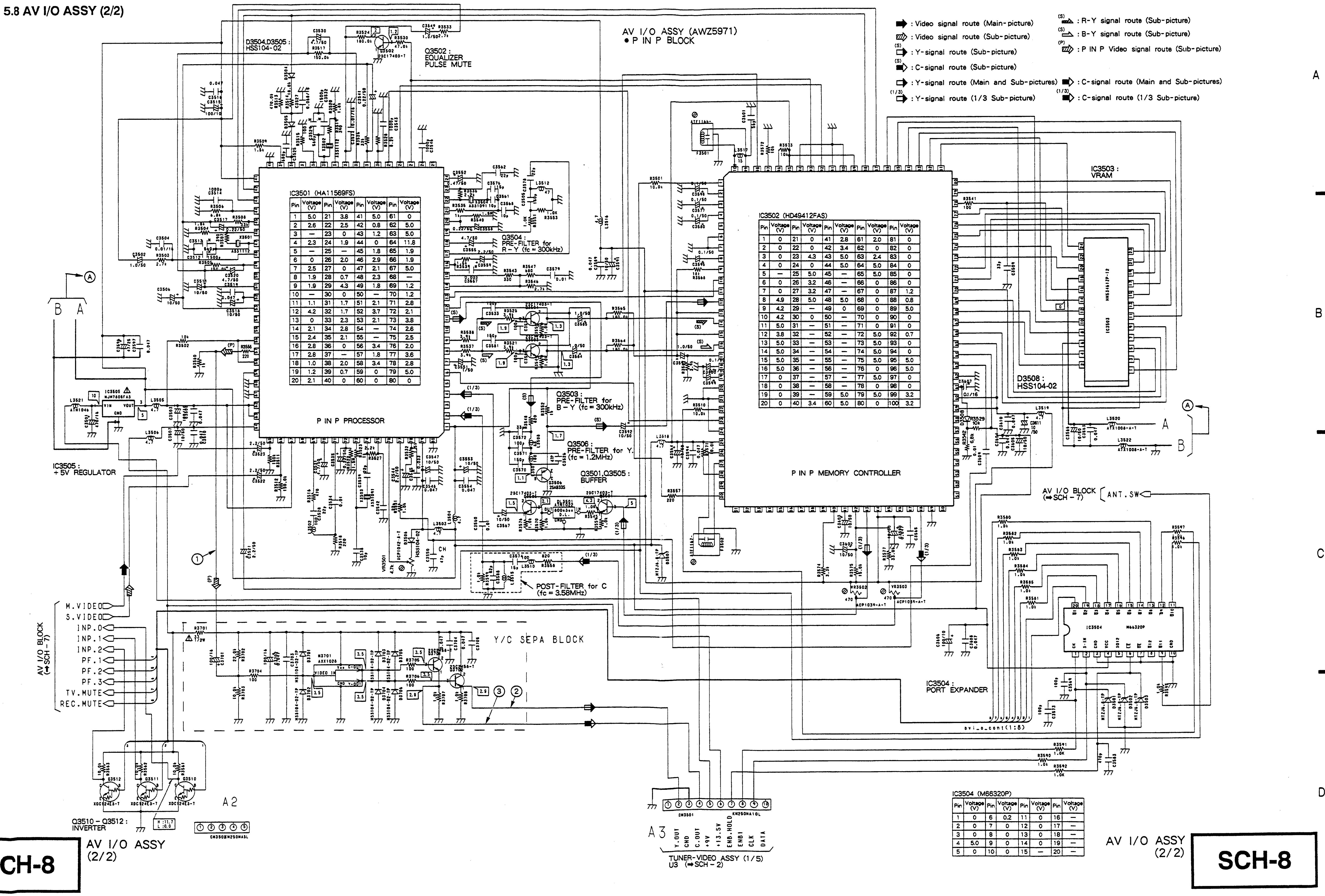
H : 13V L : 0V

IC1002

	pin 9	pin 10	pin 11
LD	L	L	H
TV	L	H	H
VIDEO	L	H	L

H : 13V L : 0V

5.8 AV I/O ASSY (2/2)


SCH – 8
AV I/O ASSY (AWZ5971)
• P IN P BLOCK
: Video signal route (Main-picture)
: Video signal route (Sub-picture)
(S) : Y-signal route (Sub-picture)
(S) : C-signal route (Sub-picture)
: Y-signal route (Main and Sub-pictures)
(1/3) : Y-signal route (1/3 Sub-picture)
(S) : R-Y signal route (Sub-picture)
(S) : B-Y signal route (Sub-picture)
(P) : P IN P Video signal route (Sub-picture)
: C-signal route (Main and Sub-pictures)
(1/3) : C-signal route (1/3 Sub-picture)
D3504,D3505 : HSS104-02
Q3502 : EQUALIZER PULSE MUTE
P IN P PROCESSOR
Q3504 : PRE-FILTER for R – Y (fc = 300kHz)
Q3503 : PRE-FILTER for B – Y (fc = 300kHz)
Q3506 : PRE-FILTER for Y. (fc = 1.2MHz)
Q3501,Q3505 : BUFFER
POST-FILTER for C (fc = 3.58MHz)
P IN P MEMORY CONTROLLER
IC3503 : VRAM
D3508 : HSS104-02
IC3505 : +5V REGULATOR
IC3505 NJM7805FA3
AV I/O BLOCK (➡SCH – 7)
ANT.SW
IC3504 : PORT EXPANDER
IC3504 M66320P
Y/C SEPA BLOCK
M.VIDEO
S.VIDEO
INP.0
INP.1
INP.2
PF.1
PF.2
PF.3
TV.MUTE
REC.MUTE
AV I/O BLOCK (➡SCH – 7)
Q3510 – Q3512 : INVERTER
A2
A3
Y.OUT
GND
C.OUT
+9V
+13.5V
ENB.HOLD
ENB1
CLK
DATA
TUNER-VIDEO ASSY (1/5) U3 (➡SCH – 2)
avi_o_cont(1:8)
A
B
CH

IC3501 (HA11569FS)

Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)
1	5.0	21	3.8	41	5.0	61	0
2	2.6	22	2.5	42	0.8	62	5.0
3	—	23	0	43	1.2	63	5.0
4	2.3	24	1.9	44	0	64	11.8
5	—	25	—	45	1.8	65	1.9
6	0	26	2.0	46	2.9	66	1.9
7	2.5	27	0	47	2.1	67	5.0
8	1.9	28	0.7	48	2.3	68	—
9	1.9	29	4.3	49	1.8	69	1.2
10	—	30	0	50	—	70	1.2
11	1.1	31	1.7	51	2.1	71	2.8
12	4.2	32	1.7	52	3.7	72	2.1
13	0	33	2.3	53	2.1	73	3.8
14	2.1	34	2.8	54	—	74	2.6
15	2.4	35	2.1	55	—	75	2.5
16	2.8	36	0	56	3.4	76	2.0
17	2.8	37	—	57	1.8	77	3.6
18	1.0	38	2.0	58	3.4	78	2.8
19	1.2	39	0.7	59	0	79	5.0
20	2.1	40	0	60	0	80	0

IC3502 (HD49412FAS)

Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)
1	0	21	0	41	2.8	61	2.0	81	0
2	0	22	0	42	3.4	62	0	82	0
3	0	23	4.3	43	5.0	63	2.4	83	0
4	0	24	0	44	5.0	64	5.0	84	0
5	—	25	5.0	45	—	65	5.0	85	0
6	0	26	3.2	46	—	66	0	86	0
7	0	27	3.2	47	—	67	0	87	1.2
8	4.9	28	5.0	48	5.0	68	0	88	0.8
9	4.2	29	—	49	0	69	0	89	5.0
10	4.2	30	0	50	—	70	0	90	0
11	5.0	31	—	51	—	71	0	91	0
12	3.8	32	—	52	—	72	5.0	92	0.7
13	5.0	33	—	53	—	73	5.0	93	0
14	5.0	34	—	54	—	74	5.0	94	0
15	5.0	35	—	55	—	75	5.0	95	5.0
16	5.0	36	—	56	—	76	0	96	5.0
17	0	37	—	57	—	77	5.0	97	0
18	0	38	—	58	—	78	0	98	0
19	0	39	—	59	5.0	79	5.0	99	3.2
20	0	40	3.4	60	5.0	80	0	100	3.2

IC3504 (M66320P)

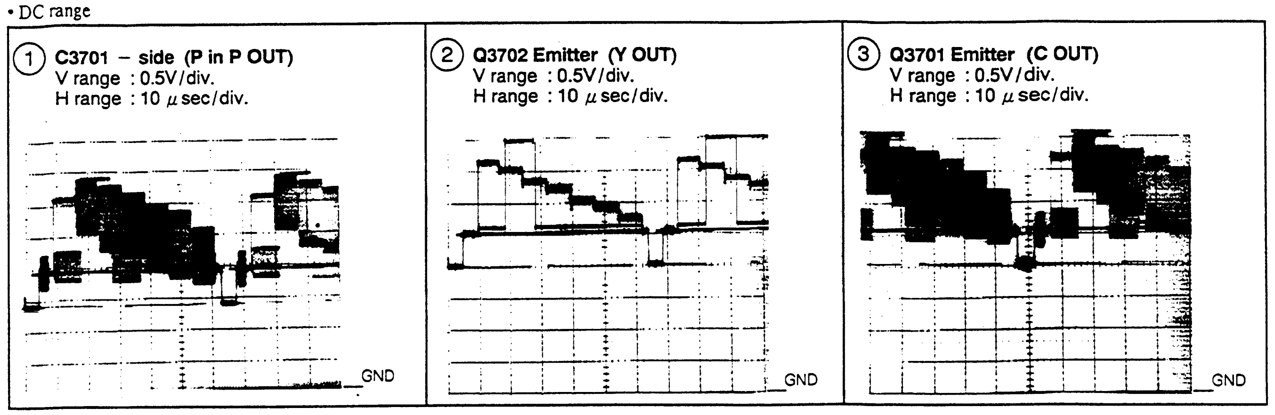
Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)	Pin	Voltage (V)
1	0	6	0.2	11	0	16	—
2	0	7	0	12	0	17	—
3	0	8	0	13	0	18	—
4	5.0	9	0	14	0	19	—
5	0	10	0	15	—	20	—

SCH-8 AV I/O ASSY (2/2)

AV I/O ASSY (2/2) **SCH-8**

Waveforms at P IN P block of AV I/O ASSY (2/2)

- Input signal : Color bar
- Picture quality : Standard
- DC range



PCB – 2

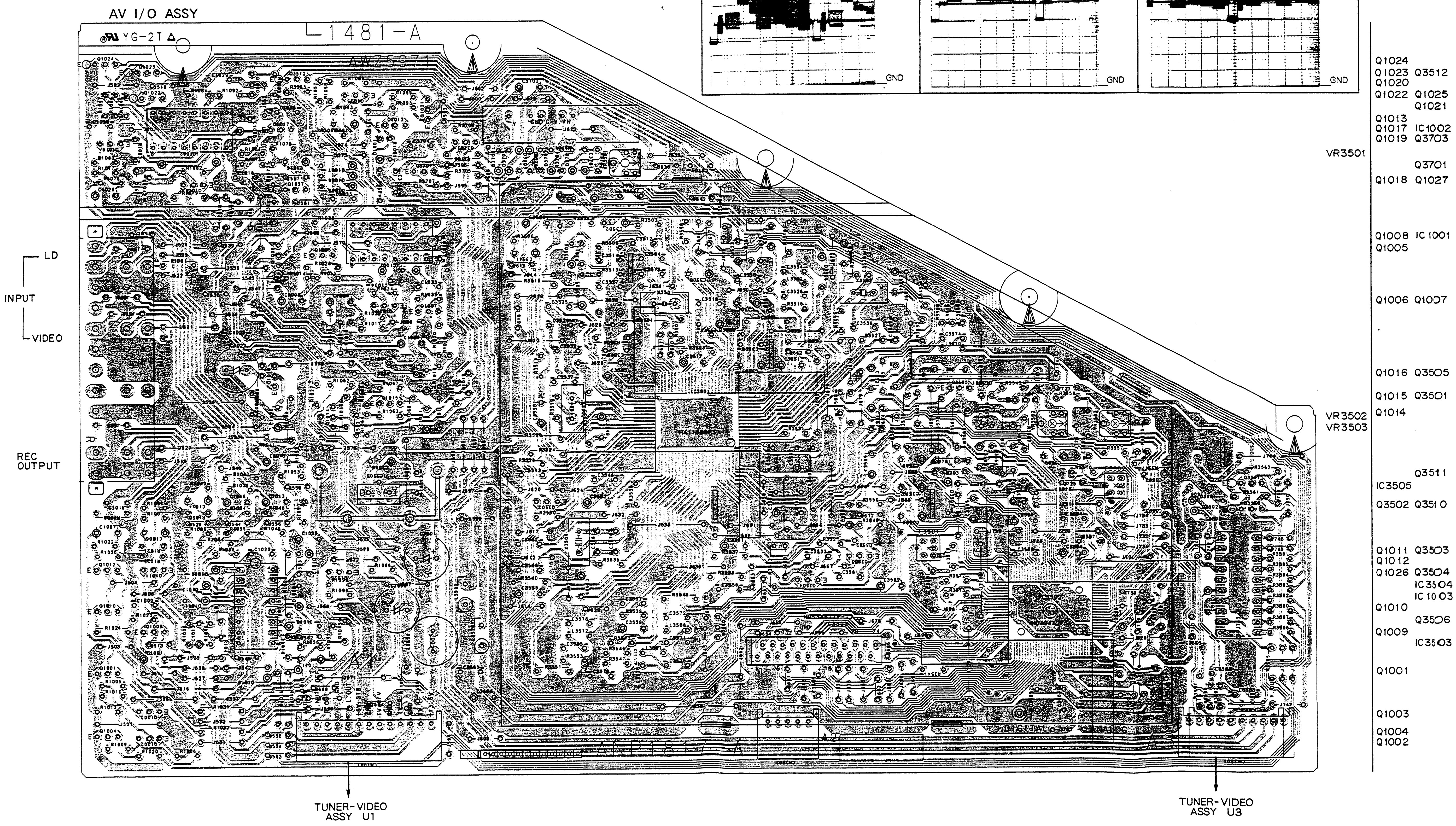
- **This diagram is viewed from the mounted parts side.**

A

B

C

D


AV I/O ASSY
YG-2T
1481-A
AWZ5971
ANP1817-A
DIGITAL
ANALOG
LD
INPUT
VIDEO
REC OUTPUT
TUNER-VIDEO ASSY U1
TUNER-VIDEO ASSY U3
VR3501
VR3502
VR3503
Q1024
Q1023 Q3512
Q1020
Q1022 Q1025
Q1021
Q1013
Q1017 IC1002
Q1019 Q3703
Q3701
Q1018 Q1027
Q1008 IC1001
Q1005
Q1006 Q1007
Q1016 Q3505
Q1015 Q3501
Q1014
Q3511
IC3505
Q3502 Q3510
Q1011 Q3503
Q1012
Q1026 Q3504
IC3504
IC1003
Q1010
Q3506
Q1009
IC3503
Q1001
Q1003
Q1004
Q1002

A

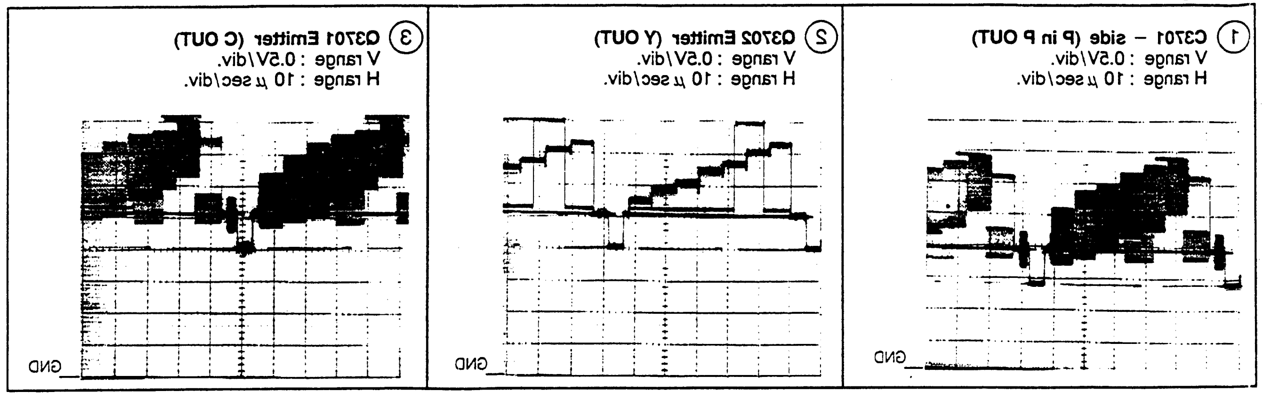
B

C

D

Waveforms at P IN P block of AV I/O ASSY (2/2)

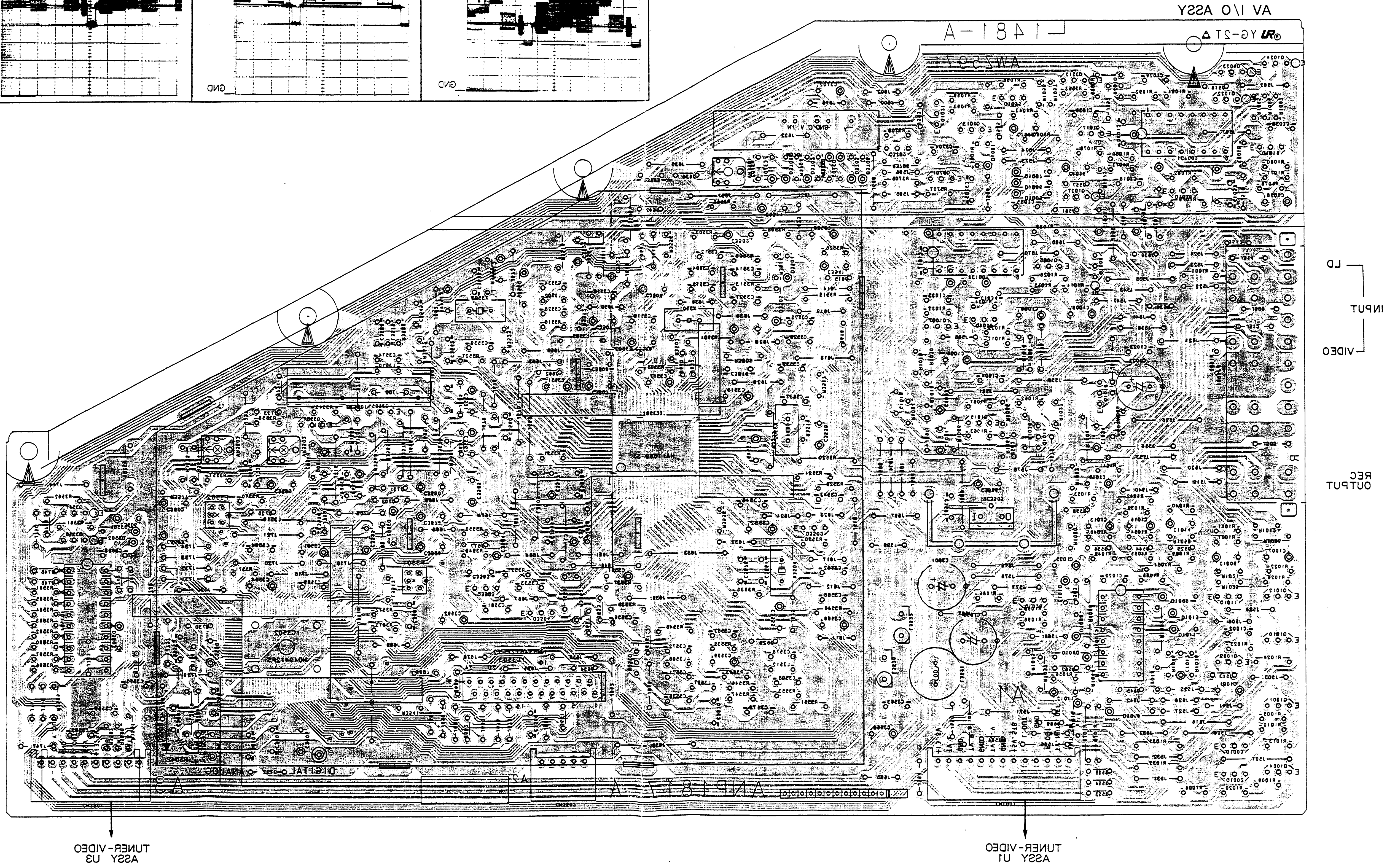
- Input signal : Color bar
- Picture quality : Standard
- DC range



PCB-2

• **This diagram is viewed from the foil side.**

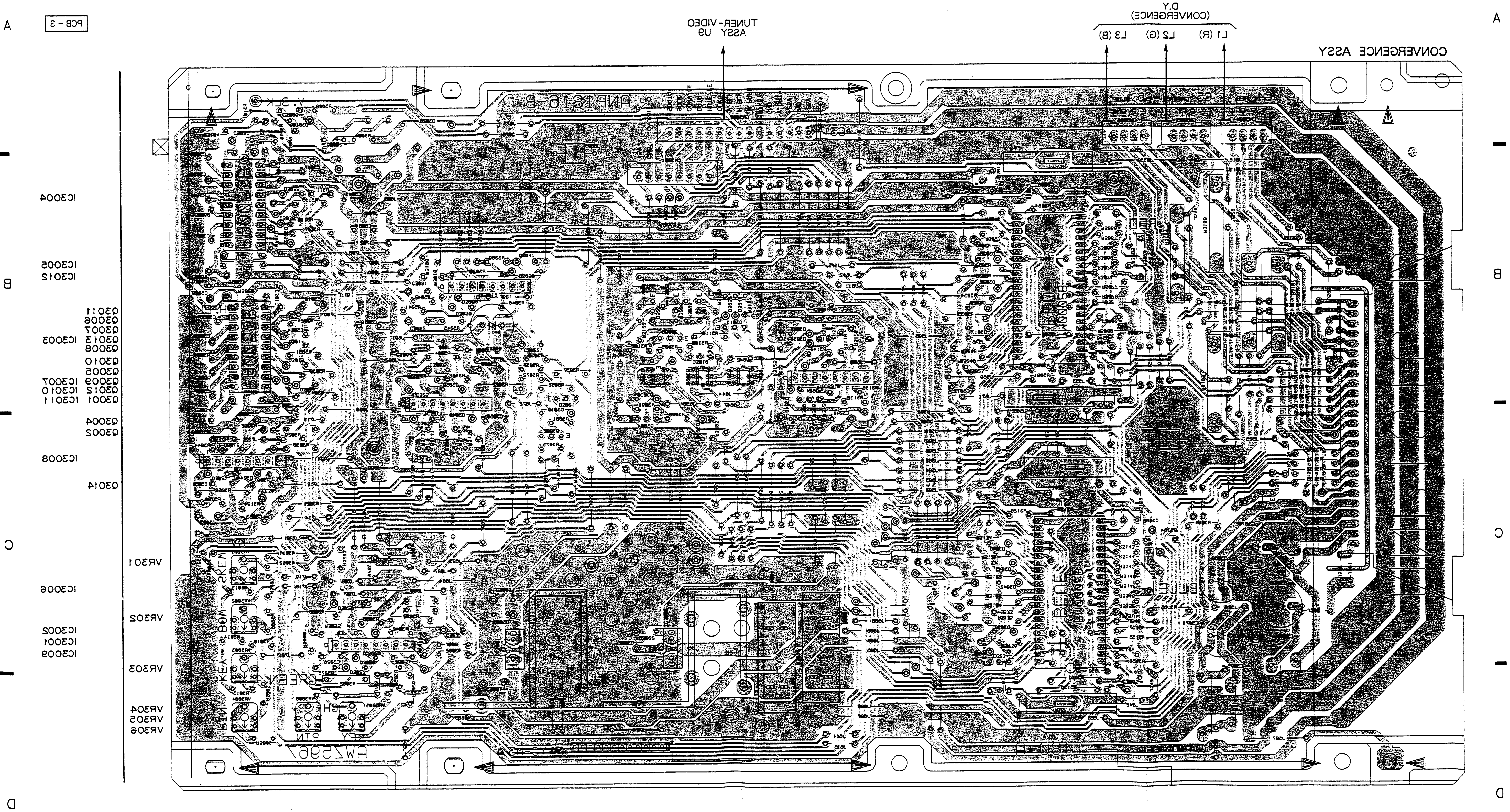
Q1024
Q1023 Q3512
Q1020
Q1022 Q1025
Q1021
Q1013
Q1017 IC1002
Q1019 Q3703
VR3501
Q3701
Q1018 Q1027
Q1008 IC1001
Q1005
Q1006 Q1007
Q1016 Q3505
Q1015 Q3501
Q1014 VR3502 VR3503
Q3511
IC3505
Q3502 Q3510
Q1011 Q3503
Q1012
Q1026 Q3504
IC3504
IC1003
Q1010
Q3506
Q1009
IC3503
Q1001
Q1003
Q1004
Q1002


AV I/O ASSY
ANP1481-A
ANP1817-A
AWZ5071
YG-27
LD
INPUT
VIDEO
REC OUTPUT
L
R
A1
A2
A3
ANALOG
DIGITAL
CN1001
CN1002
CN3501
CN3502
CN3503

TUNER-VIDEO ASSY U3

TUNER-VIDEO ASSY U1

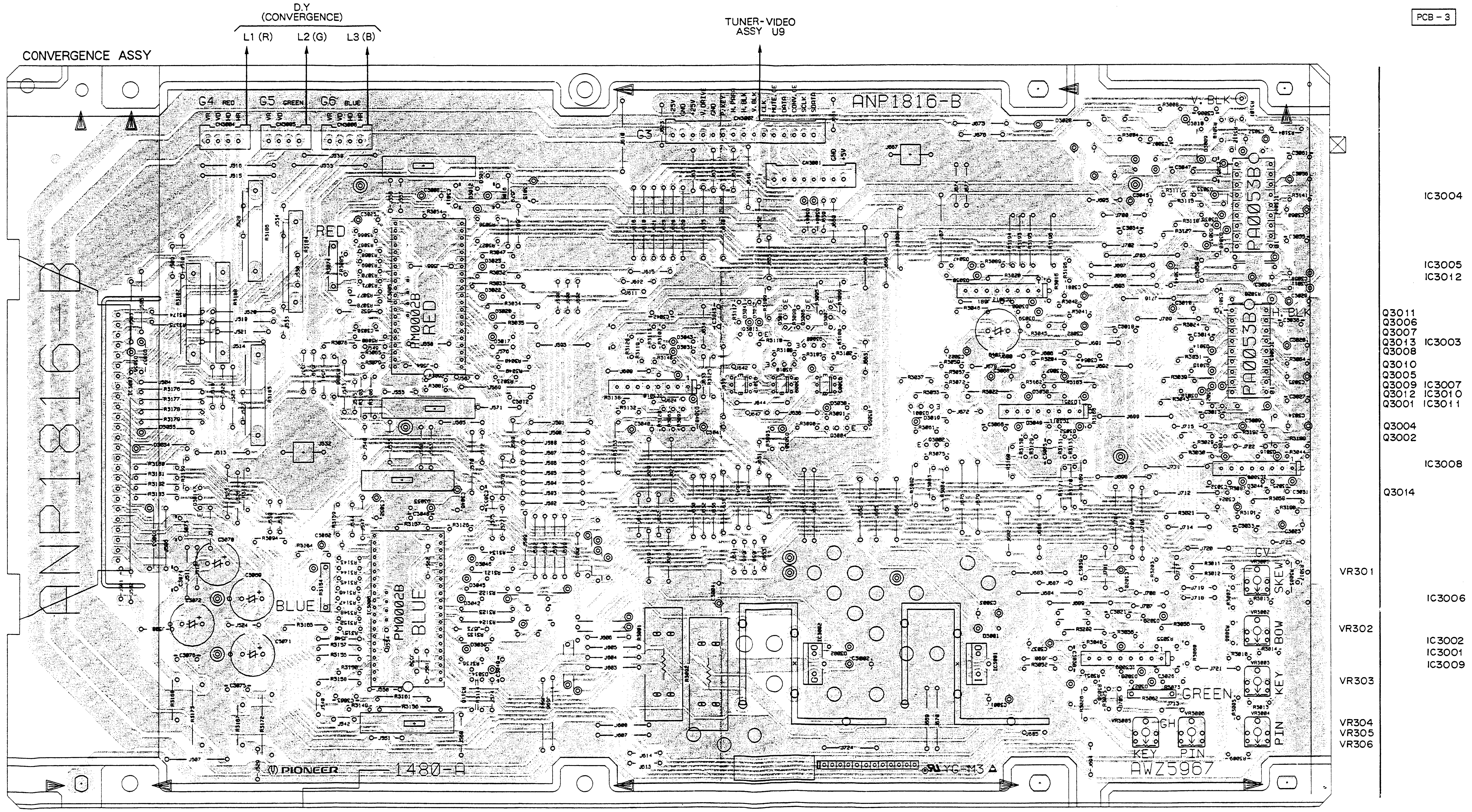
5.9 CONVERGENCE ASSY


PCB - 3
TUNER - VIDEO
ASSY U9
D.Y
(CONVERGENCE)
L1 (R)
L2 (G)
L3 (B)
CONVERGENCE ASSY
ANP1816-B
AWZ596
IC3004
IC3005
IC3012
Q3011
Q3006
Q3007
IC3003 Q3013
Q3008
Q3010
Q3005
IC3007 Q3009
IC3010 Q3012
IC3011 Q3001
Q3004
Q3002
IC3008
Q3014
VR301
IC3006
VR302
IC3002
IC3001
IC3009
VR303
VR304
VR305
VR306

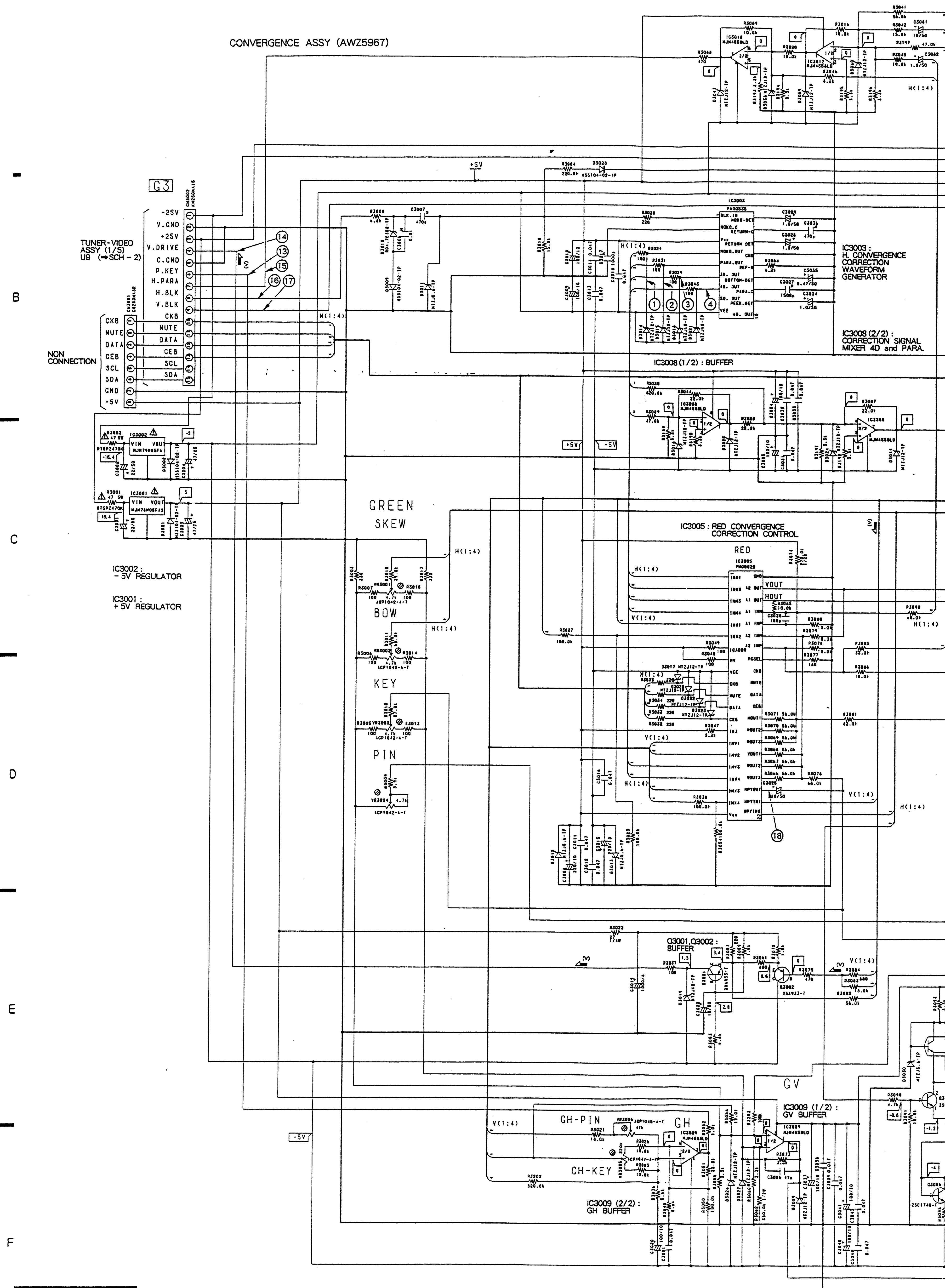
- This diagram is viewed from the foil side.

5.9 CONVERGENCE ASSY

PCB – 3

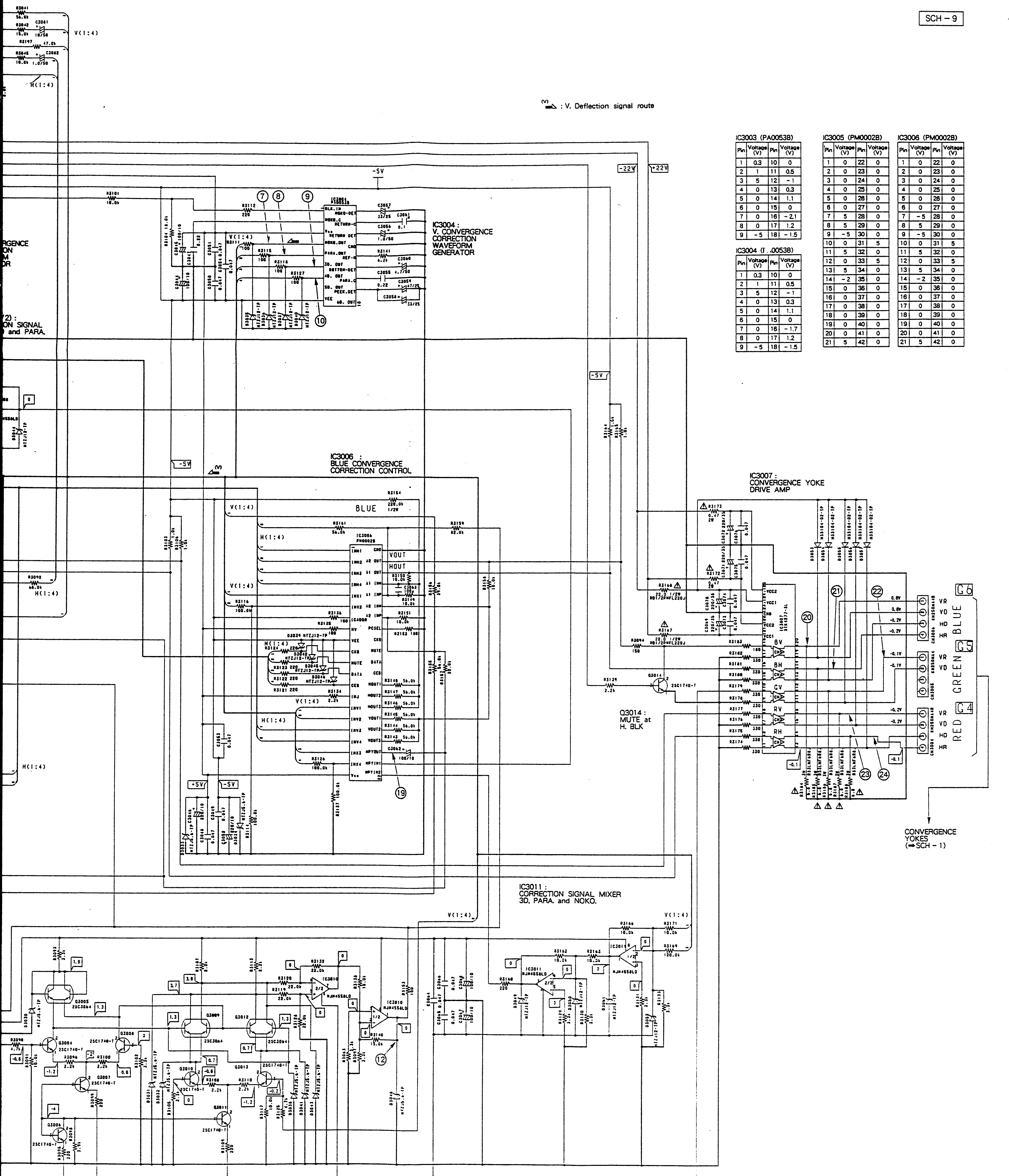

D.Y
(CONVERGENCE)
L1 (R)
L2 (G)
L3 (B)
TUNER-VIDEO
ASSY U9
CONVERGENCE ASSY
ANP1816-B
G4 RED
G5 GREEN
G6 BLUE
G3
25V
GND
25V
V.DRIVE
GND
P.KEY
H.PARA
H.BLK
V.BLK
CLK
MUTE
DATA
CONV.E
SCLK
SDATA
GND
+5V
RED
PM0002B RED
BLUE
PM0002B BLUE
PA0053B
V.BLK
H.BLK
GREEN
GV
SKEW
BOW
KEY
PIN
GH
KEY
PIN
PIONEER
1480-A
YG-M3
AWZ5967
IC3004
IC3005
IC3012
Q3011
Q3006
Q3007
Q3013
IC3003
Q3008
Q3010
Q3005
Q3009
IC3007
Q3012
IC3010
Q3001
IC3011
Q3004
Q3002
IC3008
Q3014
VR301
IC3006
VR302
IC3002
IC3001
IC3009
VR303
VR304
VR305
VR306

- **This diagram is viewed from the mounted parts side.**


CONVERGENCE ASSY (AWZ5967)
G3
TUNER-VIDEO ASSY (1/5) U9 (→SCH-2)
-25V
V.GND
+25V
V.DRIVE
C.GND
P.KEY
H.PARA
H.BLK
V.BLK
CKB
MUTE
DATA
CEB
SCL
SDA
GND
+5V
NON CONNECTION
IC3002 : -5V REGULATOR
IC3001 : +5V REGULATOR
GREEN SKEW
BOW
KEY
PIN
IC3003 : H. CONVERGENCE CORRECTION WAVEFORM GENERATOR
IC3008 (2/2) : CORRECTION SIGNAL MIXER 4D and PARA.
IC3008 (1/2) : BUFFER
IC3005 : RED CONVERGENCE CORRECTION CONTROL
RED
VOUT
HOUT
Q3001,Q3002 : BUFFER
GV
IC3009 (1/2) : GV BUFFER
GH-PIN
GH
GH-KEY
IC3009 (2/2) : GH BUFFER
H(1:4)
V(1:4)
+5V
-5V
B
C
D
E
F
1
2
3
4

SCH-9

CONVERGENCE ASSY


: V. Deflection signal route
IC3004 :
V. CONVERGENCE
CORRECTION
WAVEFORM
GENERATOR
IC3004
PA0053B
BLK.IN
NOKO-DET
NOKO.C
RETURN-C
Vcc
RETURN DET
NOKO.OUT
GND
PARA.OUT
REF-R
3D. OUT
BOTTOM-DET
4D. OUT
PARA.C
5D. OUT
PEEK.DET
VEE
6D. OUT
-5V
-22V
+22V
V(1:4)
H(1:4)
IC3006 :
BLUE CONVERGENCE
CORRECTION CONTROL
BLUE
IC3006
PM0002B
VOUT
HOUT
+5V
-5V
IC3007 :
CONVERGENCE YOKE
DRIVE AMP
IC3007
SI-K4277-SL
VCC2
VCC1
GND
BV
BH
GV
RV
RH
VR
VD
HD
HR
CN3006
CN3005
CN3004
G6
G5
G4
BLUE
GREEN
RED
CONVERGENCE
YOKES
(➡SCH – 1)
Q3014 :
MUTE at
H. BLK
IC3011 :
CORRECTION SIGNAL MIXER
3D, PARA. and NOKO.
NJM4558LD
IC3010
2SC1740-T
2SC3064
⑦
⑧
⑨
⑩
⑫
⑲
⑳
㉑
㉒
㉓
㉔
5
6
7
8
9
A
B
C
D
E
F

IC3003 (PA0053B)

Pin	Voltage (V)	Pin	Voltage (V)
1	0.3	10	0
2	1	11	0.5
3	5	12	– 1
4	0	13	0.3
5	0	14	1.1
6	0	15	0
7	0	16	– 2.1
8	0	17	1.2
9	– 5	18	– 1.5

IC3004 (PA0053B)

Pin	Voltage (V)	Pin	Voltage (V)
1	0.3	10	0
2	1	11	0.5
3	5	12	– 1
4	0	13	0.3
5	0	14	1.1
6	0	15	0
7	0	16	– 1.7
8	0	17	1.2
9	– 5	18	– 1.5

IC3005 (PM0002B)

Pin	Voltage (V)	Pin	Voltage (V)
1	0	22	0
2	0	23	0
3	0	24	0
4	0	25	0
5	0	26	0
6	0	27	0
7	5	28	0
8	5	29	0
9	– 5	30	0
10	0	31	5
11	5	32	0
12	0	33	5
13	5	34	0
14	– 2	35	0
15	0	36	0
16	0	37	0
17	0	38	0
18	0	39	0
19	0	40	0
20	0	41	0
21	5	42	0

IC3006 (PM0002B)

Pin	Voltage (V)	Pin	Voltage (V)
1	0	22	0
2	0	23	0
3	0	24	0
4	0	25	0
5	0	26	0
6	0	27	0
7	– 5	28	0
8	5	29	0
9	– 5	30	0
10	0	31	5
11	5	32	0
12	0	33	5
13	5	34	0
14	– 2	35	0
15	0	36	0
16	0	37	0
17	0	38	0
18	0	39	0
19	0	40	0
20	0	41	0
21	5	42	0

IC3010,Q3004 – Q3013 : SUB PIN SIGNAL-FORMER

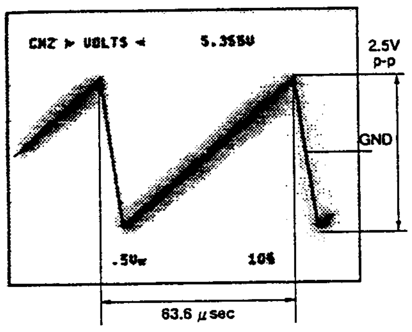
CONVERGENCE
ASSY

SCH-9

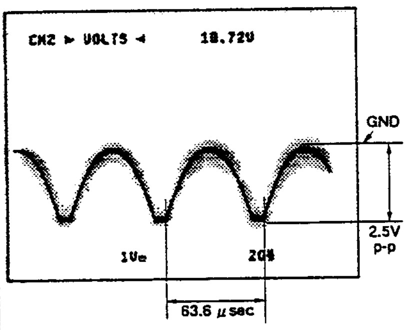
● Waveformes at CONVERGENCE assembly

- Input signal : Color bar
- Picuture quality : standard
- DC range (Unless otherwise noted.)

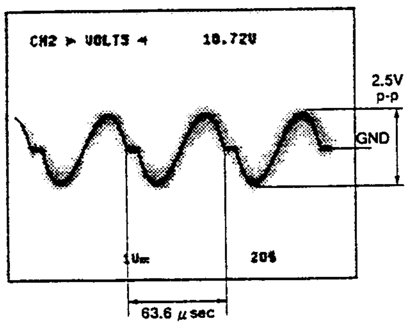
① **IC3003 pin 4**
(H SAWTOOTH WAVE OUT)
V range : 0.5V/div.
H range : 10 µsec/div.



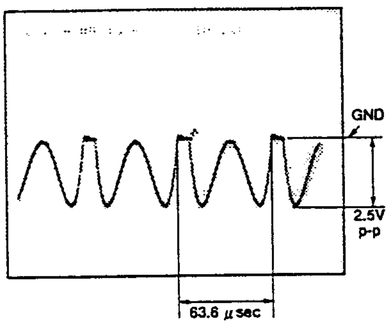
② **IC3003 pin 5**
(H PARA. WAVE OUT)
V range : 1V/div.
H range : 20 µsec/div.



③ **IC3003 pin 6**
(H 3rd-order WAVE OUT)
V range : 1V/div.
H range : 20 µsec/div.



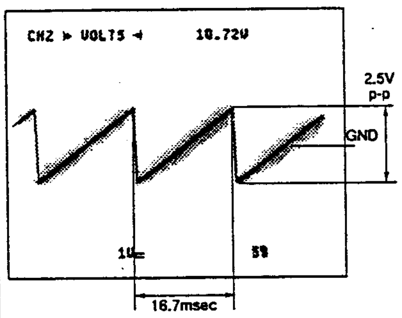
④ **IC3003 pin 7**
(H 4th-order WAVE OUT)
V range : 1V/div.
H range : 20 µsec/div.



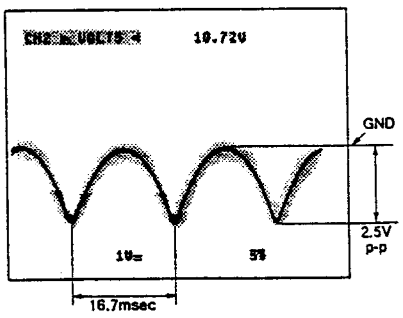
⑤

⑥

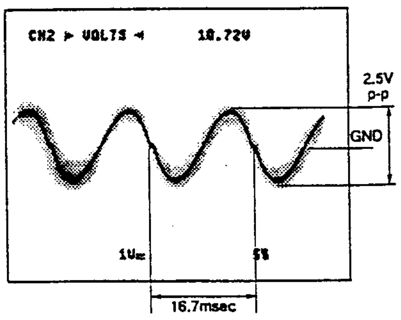
⑦ **IC3004 pin 4**
(V SAWTOOTH WAVE OUT)
V range : 1V/div.
H range : 5msec/div.



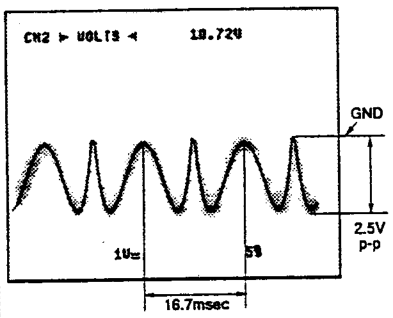
⑧ **IC3004 pin 5**
(V PARA. WAVE OUT)
V range : 1V/div.
H range : 5msec/div.



⑨ **IC3004 pin 6**
(V 3rd-order wave OUT)
V range : 1V/div.
H range : 5msec/div.

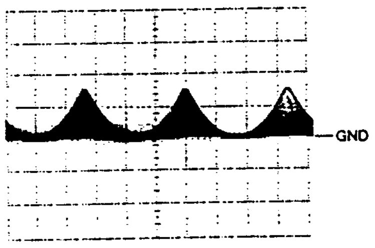


⑩ **IC3004 pin 7**
(V 4-th order WAVE OUT)
V range : 1V/div.
H range : 5msec/div.

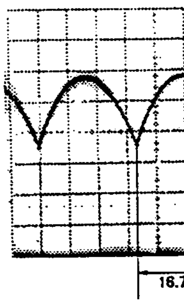


⑪

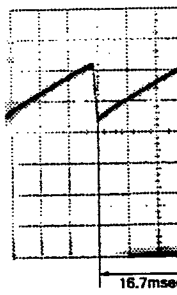
⑫ **IC3010 pin 1**
V range : 0.5V/div.
H range : 5msec/div.



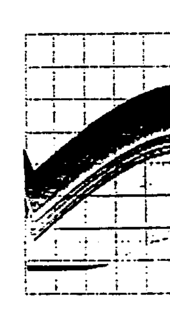
⑬ **G3 pin P. KE**
V range : 1V/
H range : 5m



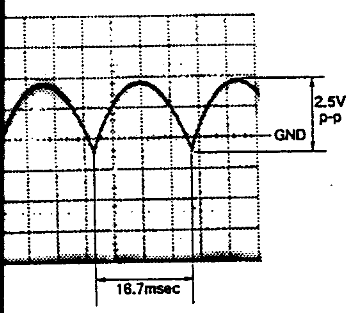
⑭ **G3 pin V. D**
V range : 1V
H range : 5m



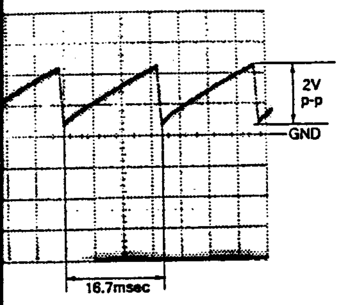
⑮ **G3 pin H. P**
V range :1V
H range : 2m



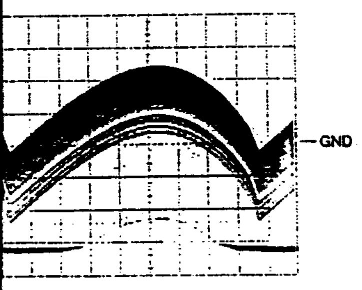
G3 pin P. KEY
V range : 1V/div.
H range : 5msec/div.



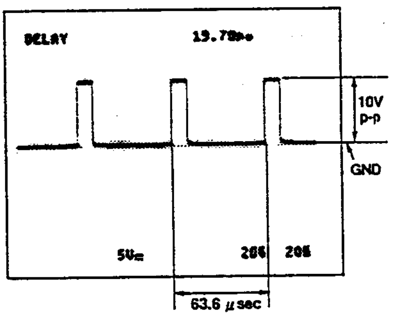
G3 pin V. DRIVE
V range : 1V/div.
H range : 5msec/div.



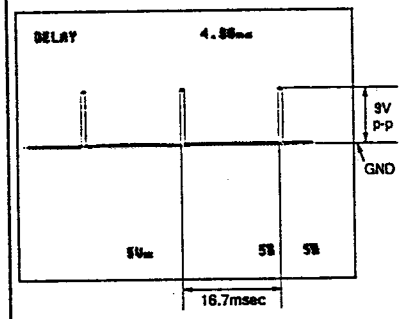
G3 pin H. PARA
V range :1V/div.
H range : 2msec/div.



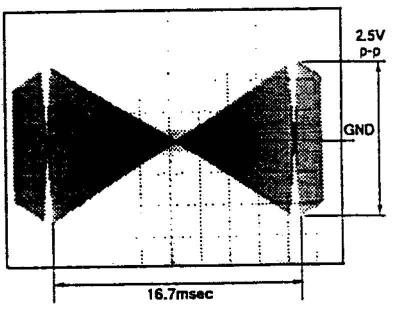
⑯ G3 pin H. BLK
V range : 5V/div.
H range : 20 μsec/div.



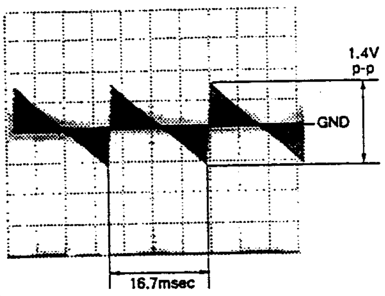
⑰ G3 pin V. BLK
V range : 5V/div.
H range : 5msec/div.



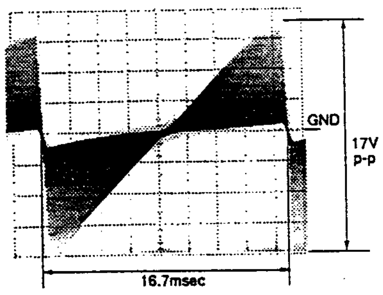
⑱ IC3005 pin 24 (MPYOUT)
V range :0.5V/div.
H range : 2msec/div.



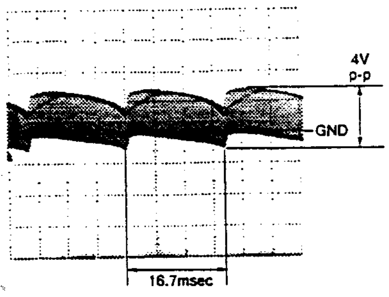
⑲ IC3006 pin 24 (MPYOUT)
V range : 0.5V/div.
H range : 5msec/div.



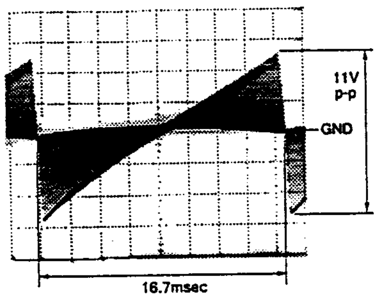
⑳ IC3007 pin 20 (BV OUT)
V range : 2V/div.
H range : 2msec/div.



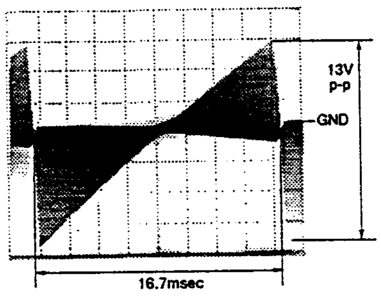
㉑ IC3007 pin 14 (BH OUT)
V range : 2V/div.
H range : 5msec/div.



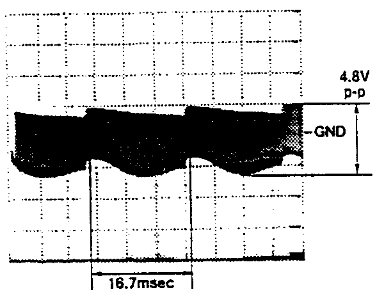
㉒ IC3007 pin 12 (GV OUT)
V range : 2V/div.
H range : 2msec/div.



㉓ IC3007 pin 6 (RV OUT)
V range : 2V/div.
H range : 2msec/div.



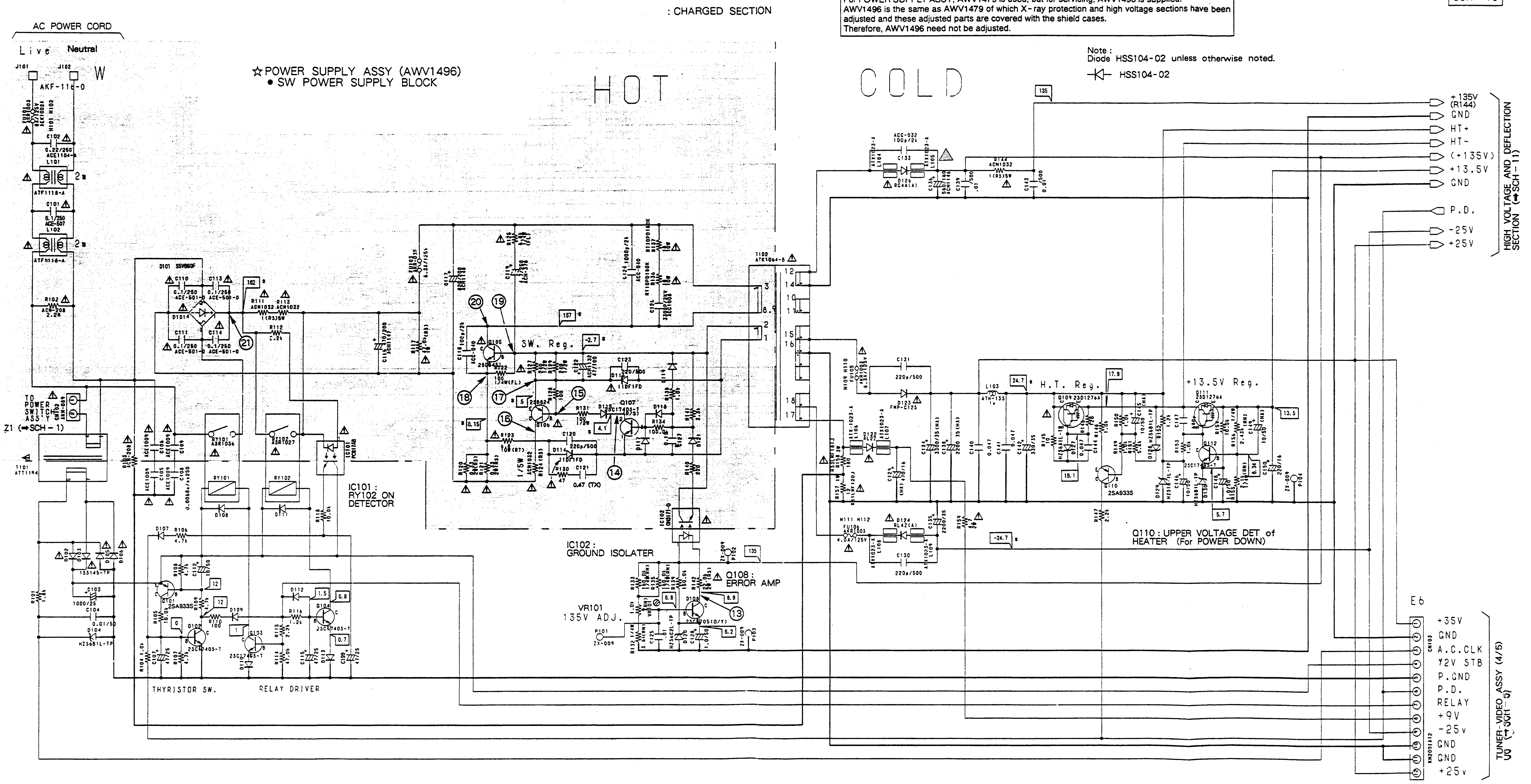
㉔ IC3007 pin 4 (RH OUT)
V range : 2V/div.
H range : 5msec/div.



5.10 POWER SUPPLY ASSY (1/2)

For POWER SUPPLY ASSY, AWV1479 is used, but for servicing, AWV1496 is supplied.
AWV1496 is the same as AWV1479 of which X-ray protection and high voltage sections have been adjusted and these adjusted parts are covered with the shield cases.
Therefore, AWV1496 need not be adjusted.

SCH – 10


: CHARGED SECTION
AC POWER CORD
Live
Neutral
☆POWER SUPPLY ASSY (AWV1496)
• SW POWER SUPPLY BLOCK
HOT
COLD
SW. Reg.
H.T. Reg.
+13.5V Reg.
TO POWER SWITCH ASS'Y
Z1 (→SCH-1)
IC101 : RY102 ON DETECTOR
IC102 : GROUND ISOLATER
Q108 : ERROR AMP
VR101 135V ADJ.
THYRISTOR SW.
RELAY DRIVER
Q110 : UPPER VOLTAGE DET of HEATER (For POWER DOWN)
+135V (R144)
GND
HT+
HT-
(+135V)
+13.5V
GND
P.D.
-25V
+25V
HIGH VOLTAGE AND DEFLECTION SECTION (→SCH-11)
E6
+35V
GND
A.C.CLK
12V STB
P.GND
P.D.
RELAY
+9V
-25v
GND
GND
+25v
TUNER-VIDEO ASSY (4/5) (→SCH-9)

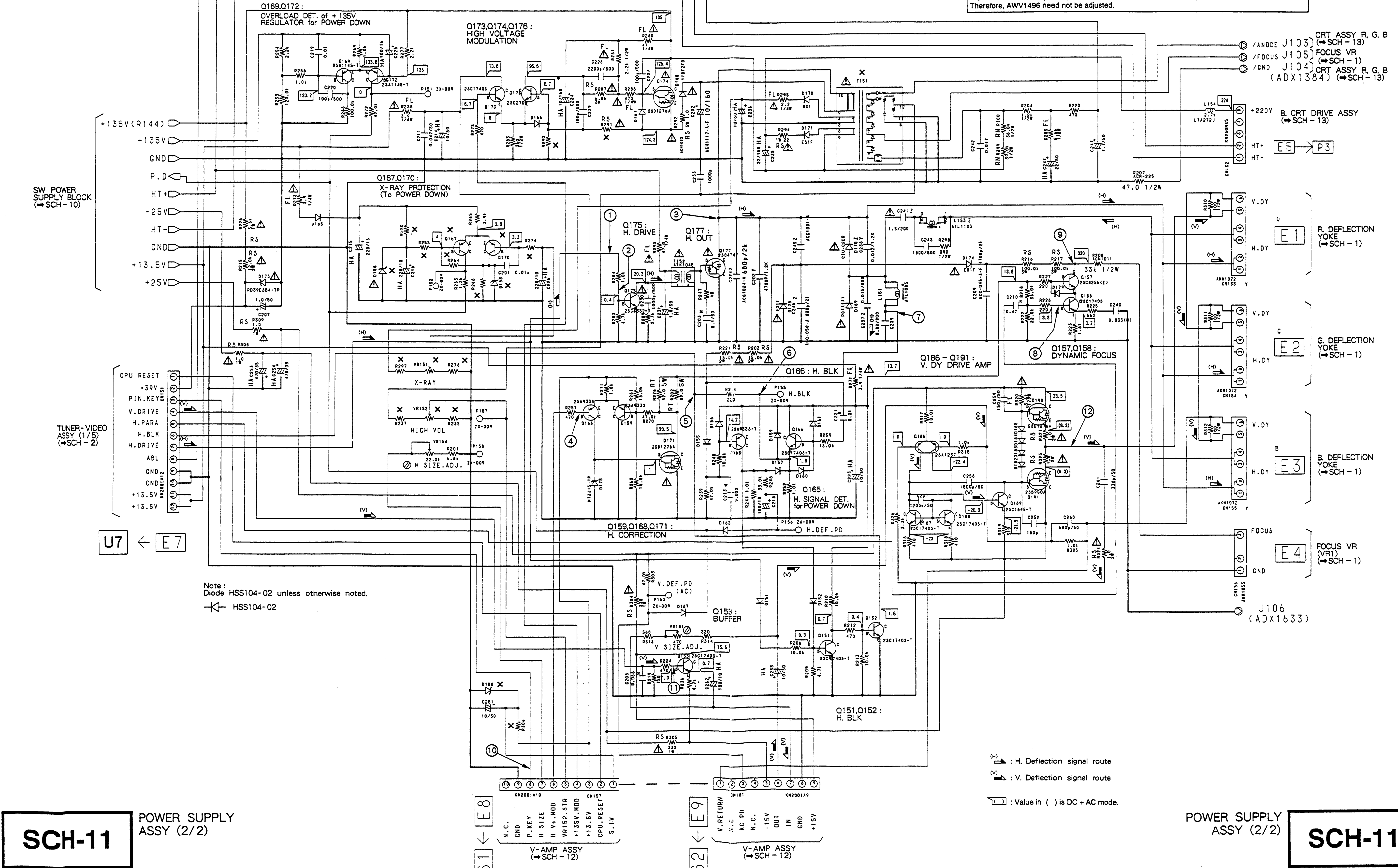
Note :
Diode HSS104-02 unless otherwise noted.
HSS104-02

▭ : DC voltage (V) is measured with digital voltmeter at no input signal.
▭* : DC voltage (V) at 50% white signal input state.

5.11 POWER SUPPLY ASSY (2/2)

☆POWER SUPPLY ASSY (AWV1496)
• HIGH VOLTAGE AND DEFLECTION BLOCK

For POWER SUPPLY ASSY, AWV1479 is used, but for servicing, AWV1496 is supplied.
AWV1496 is the same as AWV1479 of which X-ray protection and high voltage sections have been adjusted and these adjusted parts are covered with the shield cases.
Therefore, AWV1496 need not be adjusted.


A
B
C
D
Q169,Q172 :
OVERLOAD DET. of +135V
REGULATOR for POWER DOWN
Q173,Q174,Q176 :
HIGH VOLTAGE
MODULATION
SW POWER
SUPPLY BLOCK
(➡SCH - 10)
+135V(R144)
+135V
GND
P.D
HT+
-25V
HT-
GND
+13.5V
+25V
Q167,Q170 :
X-RAY PROTECTION
(To POWER DOWN)
X-RAY
HIGH VOL
H SIZE.ADJ.
CPU RESET
+39V
PIN.KEY
V.DRIVE
H.PARA
H.BLK
H.DRIVE
ABL
GND
GND
+13.5V
+13.5V
TUNER-VIDEO
ASSY (1/5)
(➡SCH - 2)
U7
E7
Q175 :
H. DRIVE
Q177 :
H. OUT
Q166 : H. BLK
H.BLK
Q165 :
H. SIGNAL DET.
for POWER DOWN
H.DEF.PD
Q159,Q168,Q171 :
H. CORRECTION
Q186 - Q191 :
V. DY DRIVE AMP
Q157,Q158 :
DYNAMIC FOCUS
33k 1/2W
T151
/ANODE J103
/FOCUS J105
/GND J104
CRT ASSY R, G, B
(➡SCH - 13)
FOCUS VR
(➡SCH - 1)
CRT ASSY R, G, B
(ADX1384) (➡SCH - 13)
+220V
B. CRT DRIVE ASSY
(➡SCH - 13)
HT+
HT-
E5
P3
47.0 1/2W
V.DY
H.DY
E1
R. DEFLECTION
YOKE
(➡SCH - 1)
E2
G. DEFLECTION
YOKE
(➡SCH - 1)
E3
B. DEFLECTION
YOKE
(➡SCH - 1)
FOCUS
GND
E4
FOCUS VR
(VR1)
(➡SCH - 1)
J106
(ADX1633)
V.DEF.PD
(AC)
Q153 :
BUFFER
V SIZE.ADJ.
Q151,Q152 :
H. BLK
RS R305
330
1W
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
KN2001A10
CN157
N.C.
GND
P.KEY
H SIZE
H Vc.MOD
VR152.STR
+135V.MOD
+13.5V
CPU.RESET
5.1V
E8
S1
V-AMP ASSY
(➡SCH - 12)
CN181
KN2001A9
V.RETURN
N.C.
AC PD
N.C.
-15V
OUT
IN
GND
+15V
E9
S2
V-AMP ASSY
(➡SCH - 12)

Note :
Diode HSS104-02 unless otherwise noted.
⊣◁⊢ HSS104-02

(H) : H. Deflection signal route
(V) : V. Deflection signal route
▭ : Value in ( ) is DC + AC mode.

SCH-11

POWER SUPPLY
ASSY (2/2)

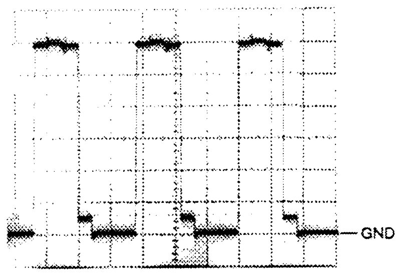
POWER SUPPLY
ASSY (2/2)

SCH-11

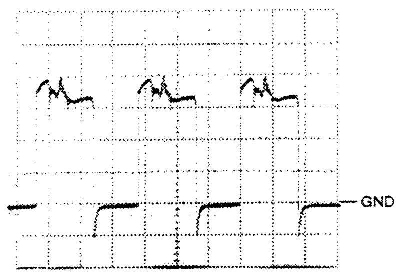
• Waveformes at Power Supply Assembly (Deflection circuit)

- Input signal : Color bar
- Picture quality : standard
- Screen size : standard
- Others : standard

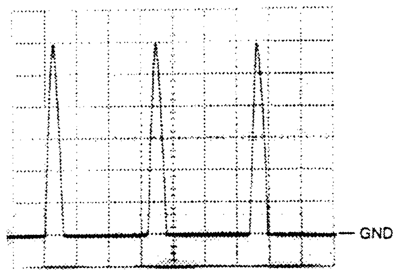
① **E7 pin H. DRIVE**
V range : 0.5V/div.
H range : 20 μsec/div.



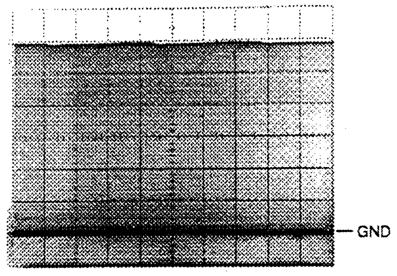
② **Q175 Base**
V range : 0.2V/div.
H range : 20 μsec/div.



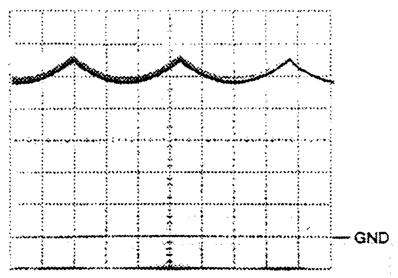
③ - 1 **Q177 Collector (H. RATE)**
V range : 200V/div.
H range : 20 μsec/div.



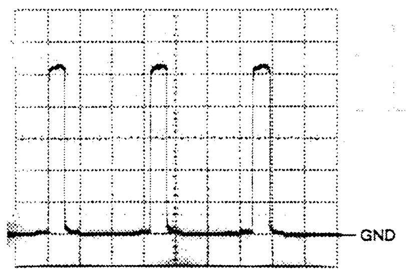
③ - 2 **Q177 Collector (V. RATE)**
V range : 200V/div.
H range : 5msec/div.



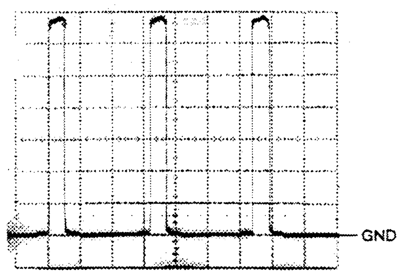
④ **Q168 Base**
V range : 2V/div.
H range : 5msec/div.



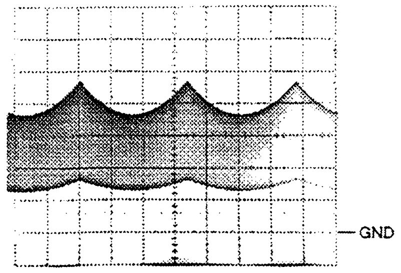
⑤ **Q152 Collector**
V range : 2V/div.
H range : 20 μsec/div.



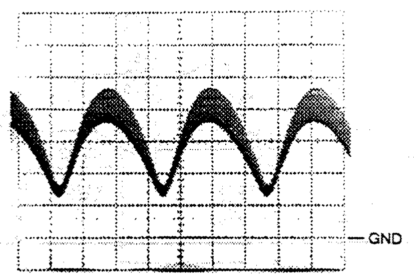
⑥ **P155 (TP–H. BLK)**
V range : 2V/div.
H range : 20 μsec/div.



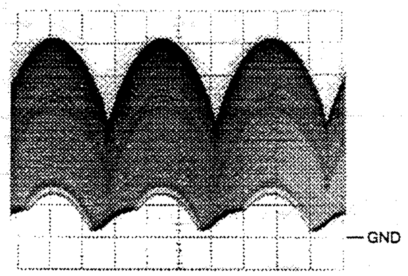
⑦ - 1 **Between C239 and L151 (V RATE)**
V range : 10V/div.
H range : 5msec/div.



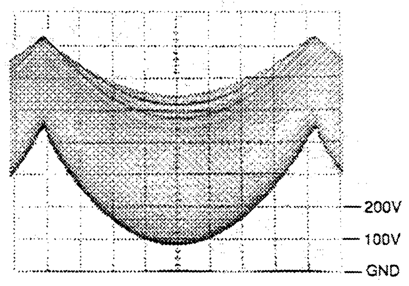
⑦ - 2 **Between C239 and L151 (H RATE)**
V range : 10V/div.
H range : 20 μsec/div.



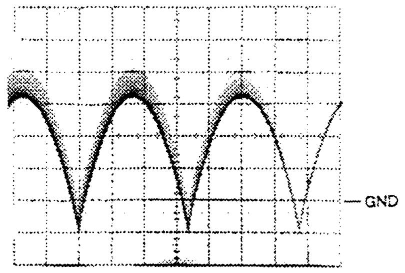
⑧ **Q158 Base (V RATE)**
V range : 1V/div.
H range : 5msec/div.



⑨ **Q157 Collector (V RATE)**
V range : 100V/div.
H range : 2msec/div.



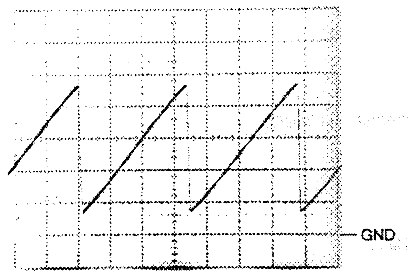
⑩ **E8 pin P KEY**
V range : 0.5V/div.
H range : 5msec/div.



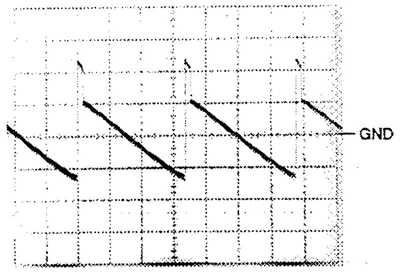
• Waveformes at Power Supply Assembly (Power Supply circuit)

- Input signal : White 50%
- Picture quality : standard
- Range : DC range (without notice)

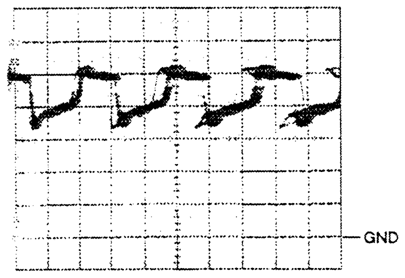
⑪ **Q153 Base**
V range : 0.5V/div.
H range : 5msec/div.



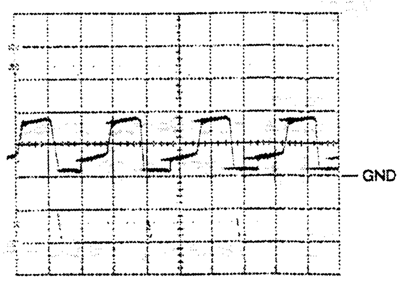
⑫ **Between R321 and R325**
V range : 10V/div.
H range : 5msec/div.



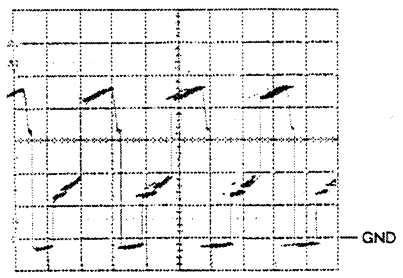
⑬ **Q108 Collector**
V range : 20V/div.
H range : 10 μsec/div.



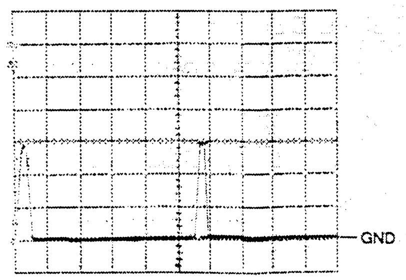
⑭ **Q107 Collector**
V range : 5V/div.
H range : 10 μsec/div.



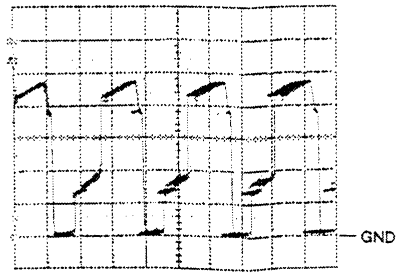
⑮ **Q106 Base**
V range : 2V/div.
H range : 10 μsec/div.



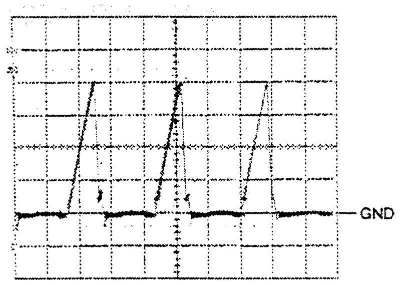
⑯ **Q106 Collector**
V range : 2V/div.
H range : 5 μsec/div.



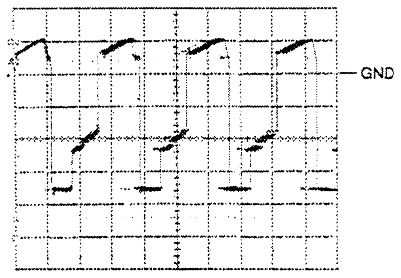
⑰ **Q106 Emitter**
V range : 2V/div.
H range : 10 μsec/div.



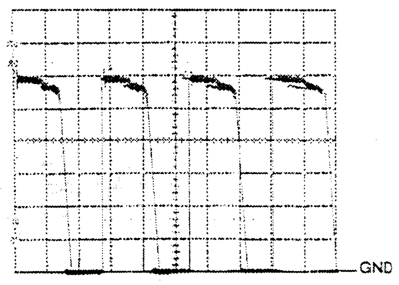
⑱ **Q105 Emitter**
V range : 0.2V/div.
H range : 10 μsec/div.



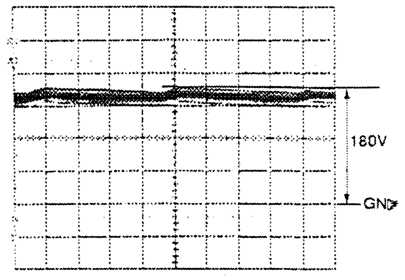
⑲ **Q105 Base**
V range : 2V/div.
H range : 10 μsec/div.



⑳ **Q105 Collector**
V range : 50V/div.
H range : 10 μsec/div.



㉑ **D101 Catode**
V range : 50V/div.
H range : 2 μsec/div.



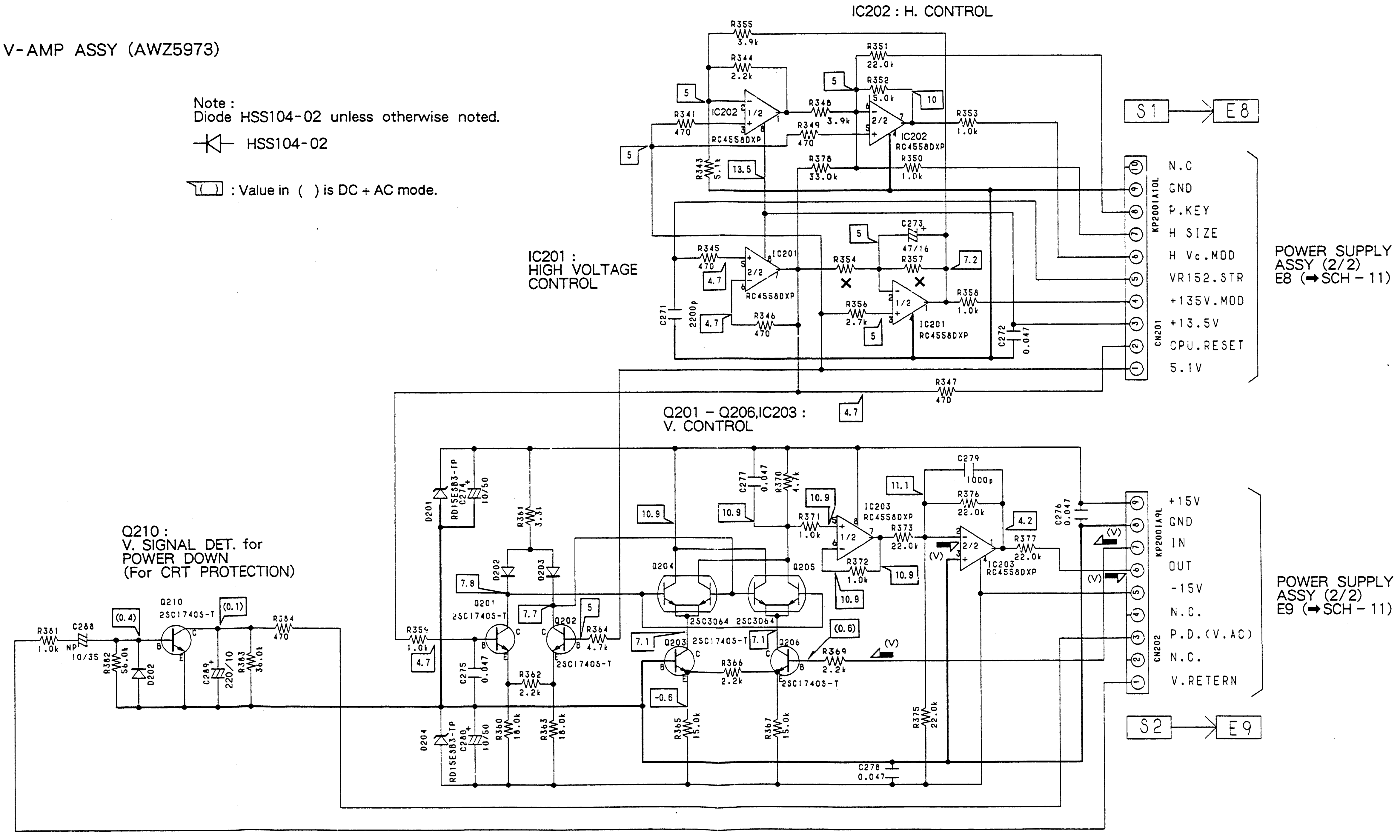
5.12 V-AMP ASSY

☆V-AMP ASSY (AWZ5973)

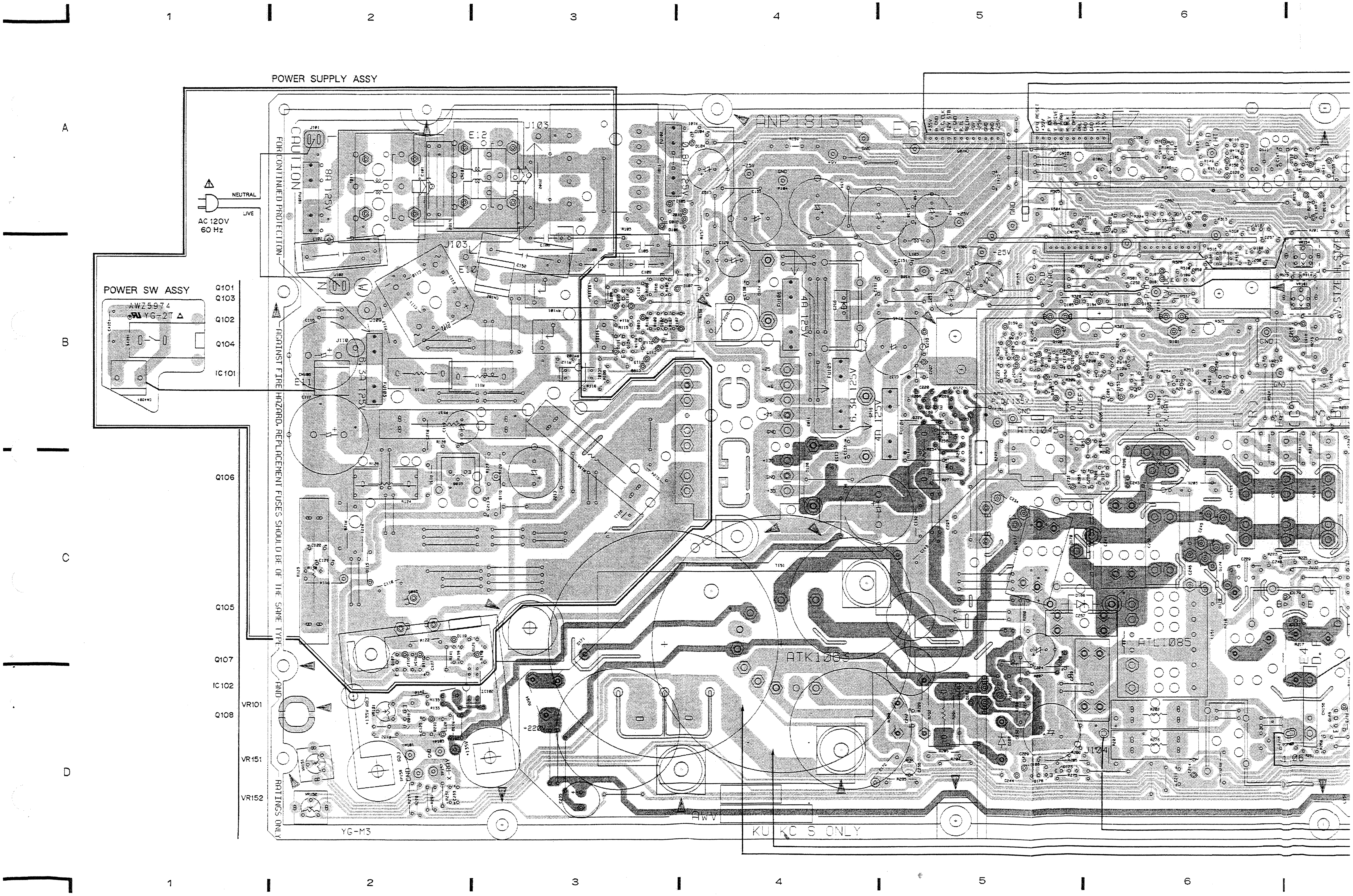
Note :
Diode HSS104-02 unless otherwise noted.
HSS104-02

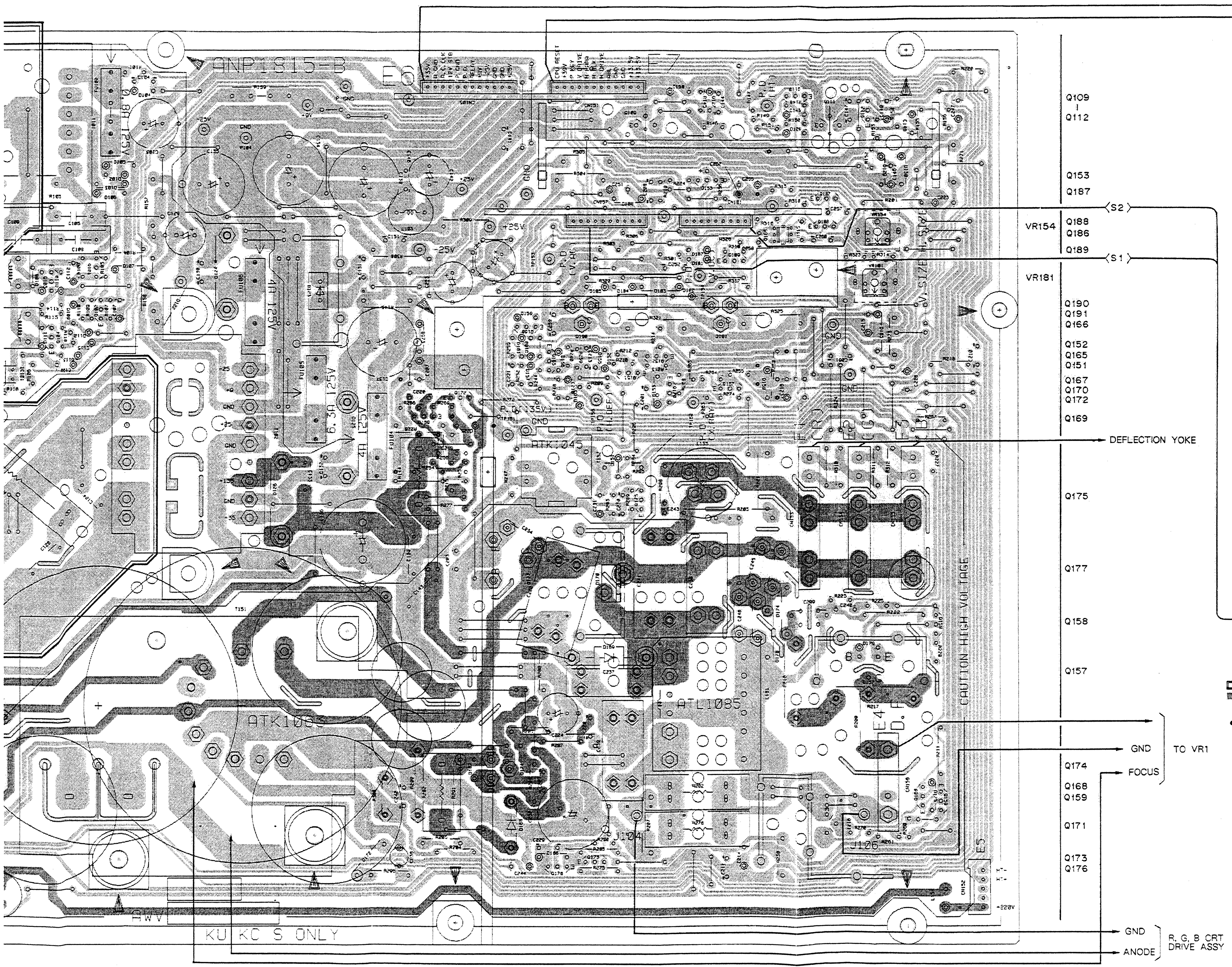
( ) : Value in ( ) is DC + AC mode.

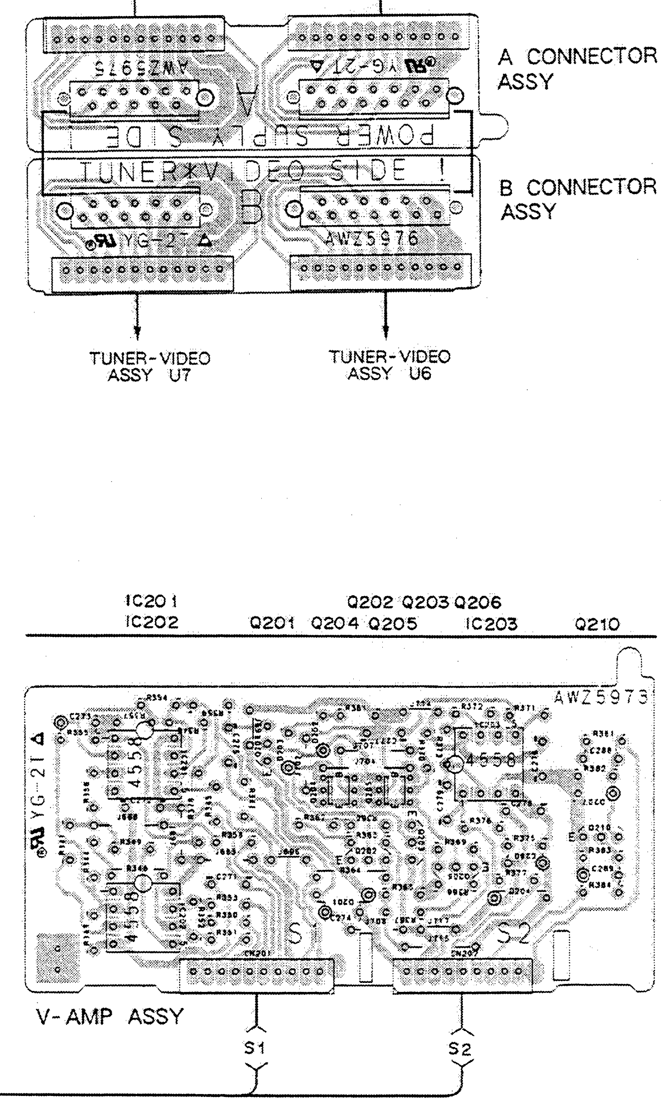
SCH – 12


IC202 : H. CONTROL
R355 3.9k
R344 2.2k
R351 22.0k
R352 5.0k
R341 470
IC202 1/2 RC4558DXP
R348 3.9k
R349 470
IC202 2/2 RC4558DXP
R353 1.0k
R343 5.1k
R378 33.0k
R350 1.0k
S1 → E8
N.C
GND
P.KEY
H SIZE
H Vc.MOD
VR152.STR
+135V.MOD
+13.5V
CPU.RESET
5.1V
KP2001A10L
CN201
POWER SUPPLY ASSY (2/2) E8 (➡SCH – 11)
IC201 : HIGH VOLTAGE CONTROL
R345 470
IC201 2/2 RC4558DXP
C273 47/16
R357
R354
R356 2.7k
IC201 1/2 RC4558DXP
R358 1.0k
C271 2200p
R346 470
C272 0.047
R347 470
Q201 – Q206,IC203 : V. CONTROL
C277 0.047
R370 4.7k
C279 1000p
R376 22.0k
IC203 RC4558DXP 1/2
R371 1.0k
R373 22.0k
R372 1.0k
IC203 2/2 RC4558DXP
R377 22.0k
C276 0.047
+15V
GND
IN
OUT
-15V
N.C.
P.D.(V.AC)
N.C.
V.RETERN
KP2001A9L
CN202
POWER SUPPLY ASSY (2/2) E9 (➡SCH – 11)
S2 → E9
D201 RD15ESB3-TP
C274 10/50
R361 3.3k
D202
D203
Q201 2SC1740S-T
Q202 2SC1740S-T
R364 4.7k
Q204
Q205
2SC3064 2SC3064
Q203 2SC1740S-T
Q206 2SC1740S-T
R366 2.2k
R369 2.2k
R359 1.0k
C275 0.047
R362 2.2k
R360 18.0k
R363 18.0k
D204 RD15ESB3-TP
C280 10/50
R365 15.0k
R367 15.0k
R375 22.0k
C278 0.047
Q210 : V. SIGNAL DET. for POWER DOWN (For CRT PROTECTION)
Q210 2SC1740S-T
R381 1.0k
C288 NP 10/35
R382 56.0k
D202
C289 220/10
R383 36.0k
R384 470
5
10
13.5
4.7
7.2
10.9
11.1
4.2
7.8
7.7
7.1
(0.4)
(0.1)
(0.6)
-0.6
(V)

(V) : V. Deflection signal route


1
2
3
4
5
6
A
B
C
D
POWER SUPPLY ASSY
POWER SW ASSY
AWZ5974
YG-2T
AC 120V
60 Hz
NEUTRAL
LIVE
Q101
Q103
Q102
Q104
IC101
Q106
Q105
Q107
IC102
VR101
Q108
VR151
VR152
CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACEMENT FUSES SHOULD BE OF THE SAME TYPE AND RATINGS ONLY
8A 125V
6.3A 125V
4A 125V
E12
E10
E11
J101
J102
J103
J110
U103
ANP1815-B
E6
ATK1045
ATK1063
ATL1085
J104
J106
E4
-25V
+25V
-220V
GND
AWV
KU KC S ONLY
YG-M3

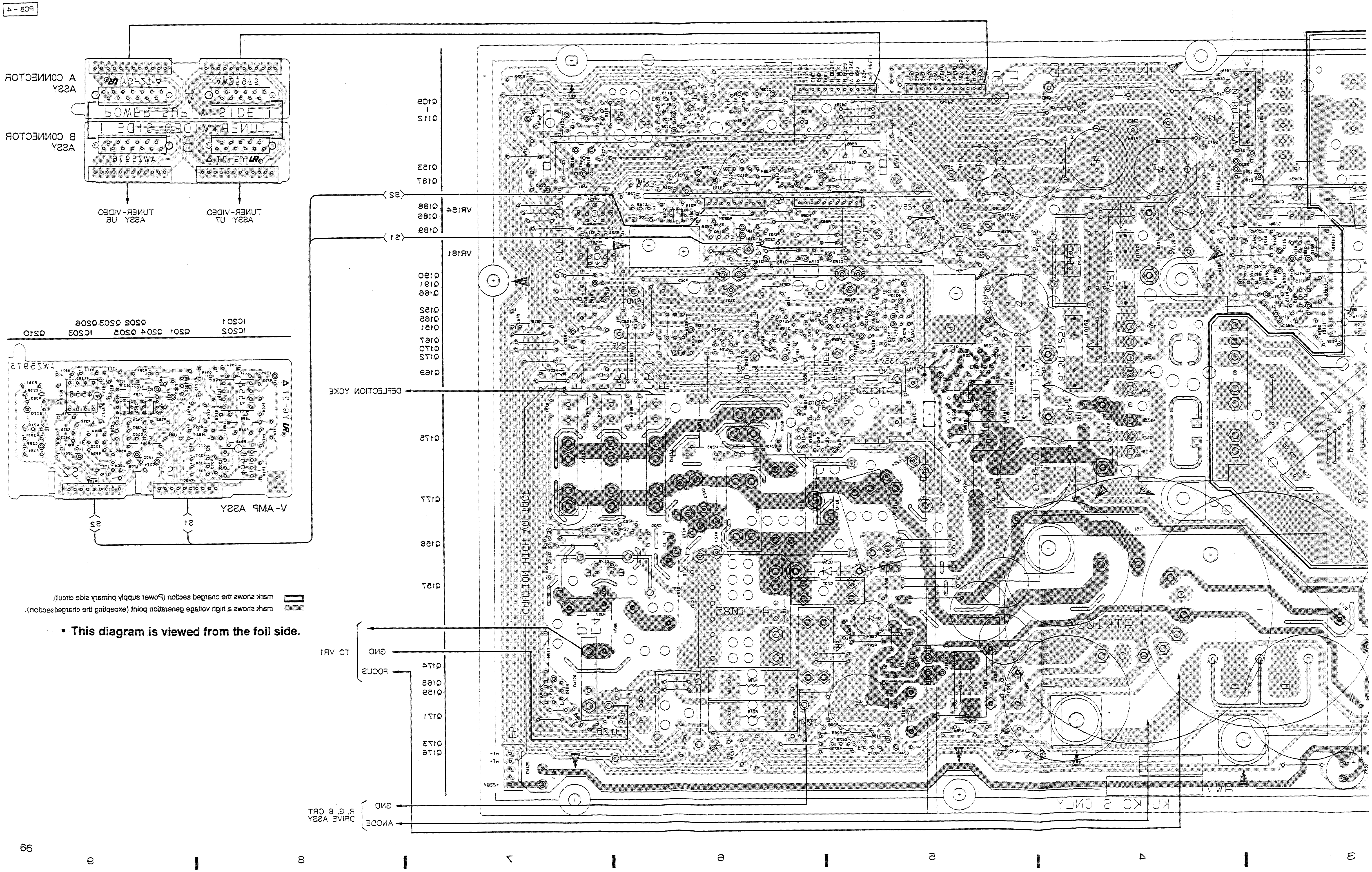

4
5
6
7
8
ANP1815-B
E6
Q109
|
Q112
Q153
Q187
Q188
Q186
Q189
VR154
VR181
S2
S1
Q190
Q191
Q166
Q152
Q165
Q151
Q167
Q170
Q172
Q169
DEFLECTION YOKE
Q175
Q177
Q158
Q157
Q174
Q168
Q159
Q171
Q173
Q176
GND
FOCUS
TO VR1
GND
ANODE
R, G, B CRT
DRIVE ASSY
ATK1045
ATL1085
ATK1083
P.D (35V)
V. SIZE
CAUTION HIGH VOLTAGE
J104
J126
E5
E4
AWV
KU KC S ONLY
4A 125V
6.3A 125V
4A 125V
+25V
-25V
+220V
A
B
C
D
9


AWZ5975
YG-2T
POWER SUPPLY SIDE
A CONNECTOR
ASSY
TUNER VIDEO SIDE
B CONNECTOR
ASSY
YG-2T
AWZ5976
TUNER-VIDEO
ASSY U7
TUNER-VIDEO
ASSY U6
IC201
IC202
Q201
Q202
Q203
Q204
Q205
Q206
IC203
Q210
AWZ5973
YG-2T
4558
4558
4558
V-AMP ASSY
S1
S2

▭ mark shows the charged section (Power supply primary side circuit).

▨ mark shows a high voltage generation point (excepting the charged section).

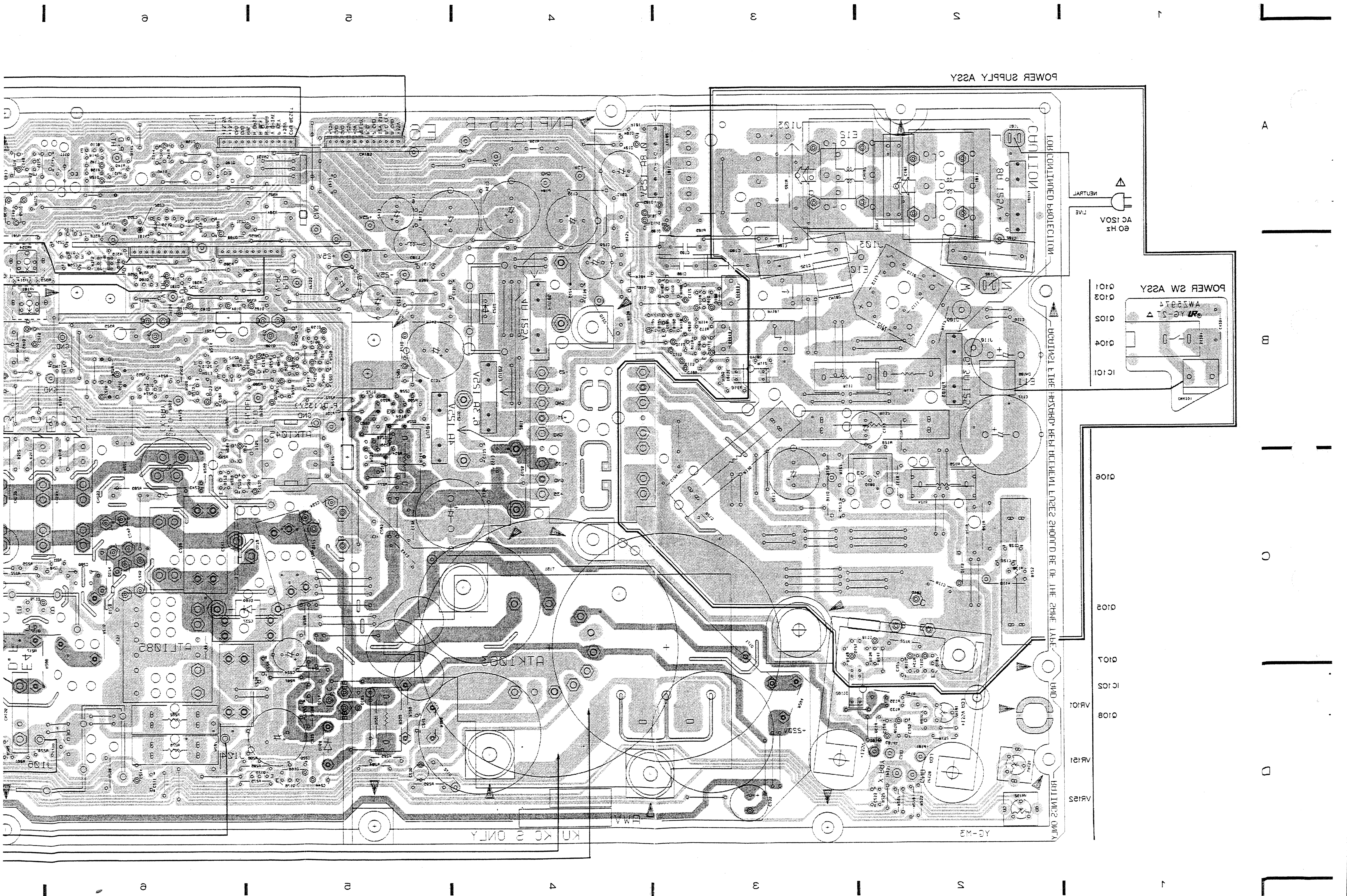
- **This diagram is viewed from the mounted parts side.**


PCB - 4
A CONNECTOR ASSY
B CONNECTOR ASSY
POWER SUPLY SIDE !
TUNER×VIDEO SIDE !
AWZ5976
TUNER-VIDEO ASSY U7
TUNER-VIDEO ASSY U6
IC201 IC202
Q202 Q203 Q206
Q201 Q204 Q205 IC203 Q210
AWZ5973
V-AMP ASSY
S1
S2
Q109 - Q112
Q153 Q187
Q188 Q186 Q189
VR154
VR181
Q190 Q191 Q166
Q152 Q165 Q151
Q167 Q170 Q172
Q169
DEFLECTION YOKE
Q175
Q177
Q158
Q157
TO VR1
GND
FOCUS
Q174
Q168 Q159
Q171
Q173 Q176
R.G.B CRT DRIVE ASSY
GND
ANODE
CURTION HIGH VOLTAGE
ATL1085
ATK1063
ATK101
ANP1815-B
KU KC S ONLY
AWV
8
7
6
5
4
3
A
B
C
D

▭ mark shows the charged section (Power supply primary side circuit).

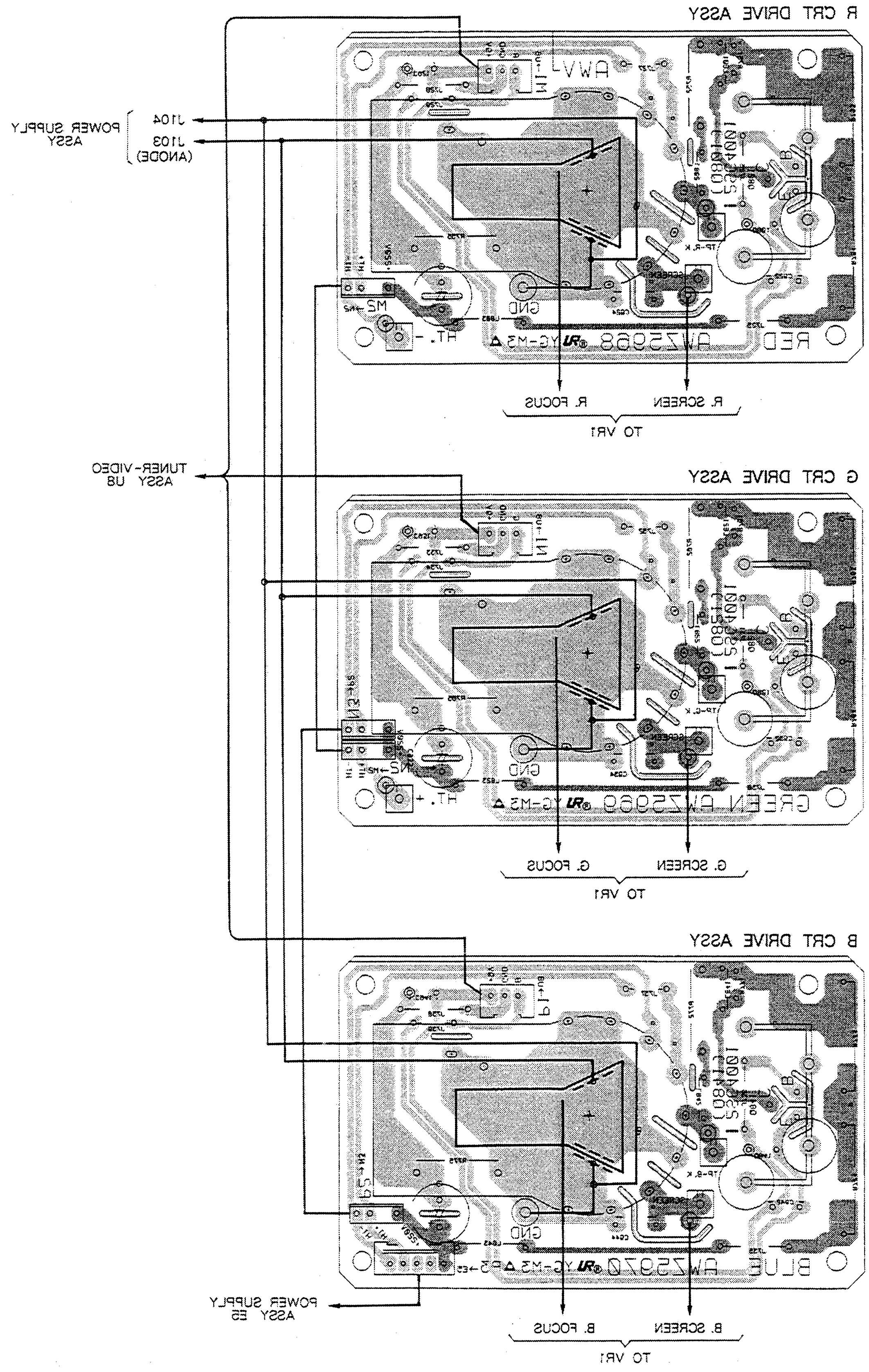
▨ mark shows a high voltage generation point (excepting the charged section).

- **This diagram is viewed from the foil side.**


1
2
3
4
5
6
A
B
C
D
POWER SUPPLY ASSY
CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACEMENT FUSES SHOULD BE OF THE SAME TYPE AND RATINGS
NEUTRAL
LIVE
AC 120V
60 Hz
POWER SW ASSY
AWZ5974
YG-2T
Q101
Q103
Q102
Q104
IC101
Q106
Q105
Q107
IC102
VR101
Q108
VR151
VR152
CNP1815-B
ATK1047
ATL1085
ATK1063
KU KC S ONLY
YG-M3
-22V

5.13 R, G, B CRT DRIVE ASSEMBLIES

PCB - 5

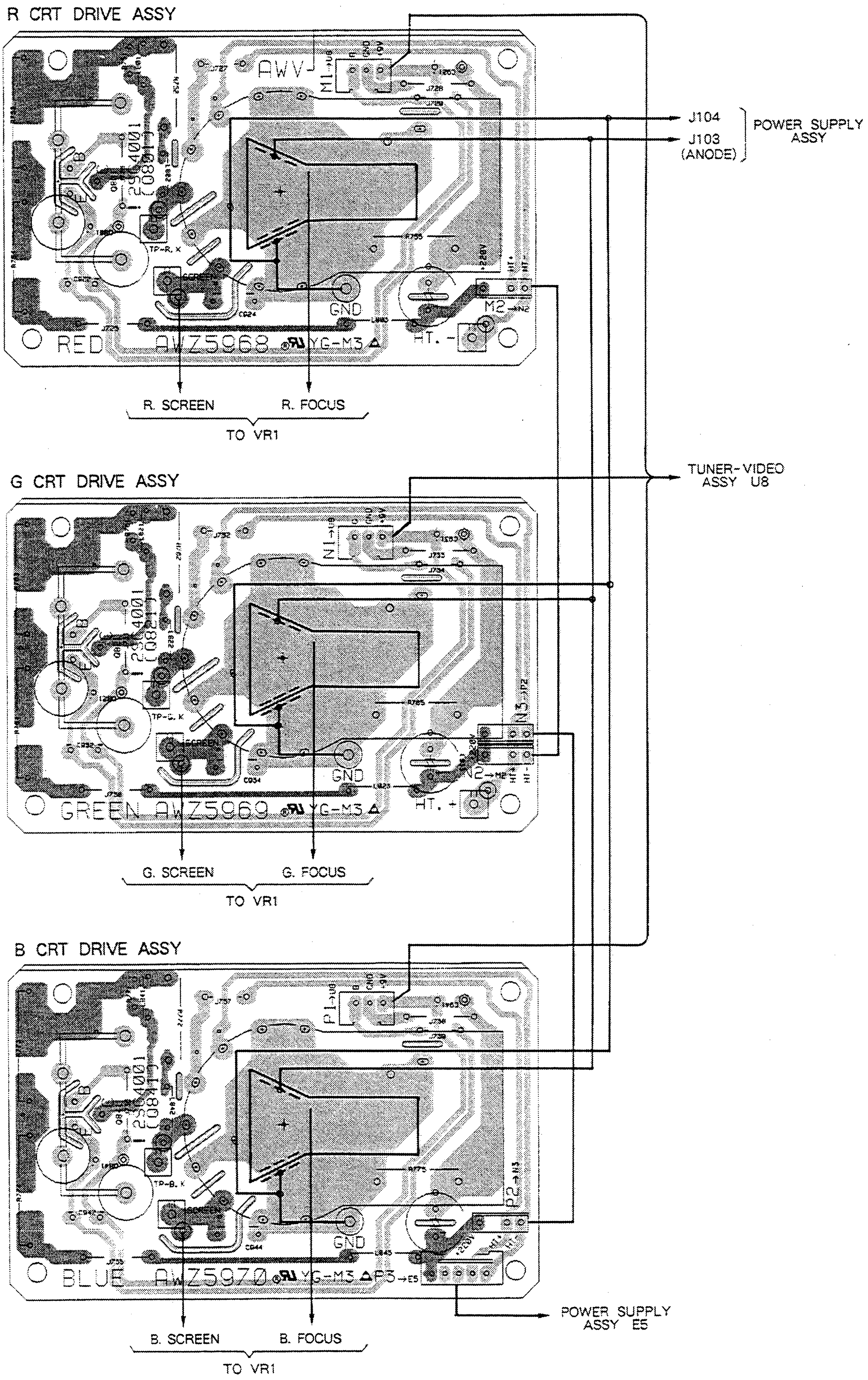

R CRT DRIVE ASSY
J104
J103 (ANODE)
POWER SUPPLY ASSY
RED AWZ5968
GND
H.T.
SCREEN
TP-R.K
R. SCREEN
R. FOCUS
TO VR1
TUNER-VIDEO ASSY U8
G CRT DRIVE ASSY
GREEN AWZ5969
G. SCREEN
G. FOCUS
TO VR1
B CRT DRIVE ASSY
BLUE AWZ5970
TP-B.K
POWER SUPPLY ASSY E5
B. SCREEN
B. FOCUS
TO VR1
A
B
C
D

▨ mark shows a high voltage generation point (excepting the charged section).

- **This diagram is viewed from the foil side.**

5.13 R, G, B CRT DRIVE ASSEMBLIES

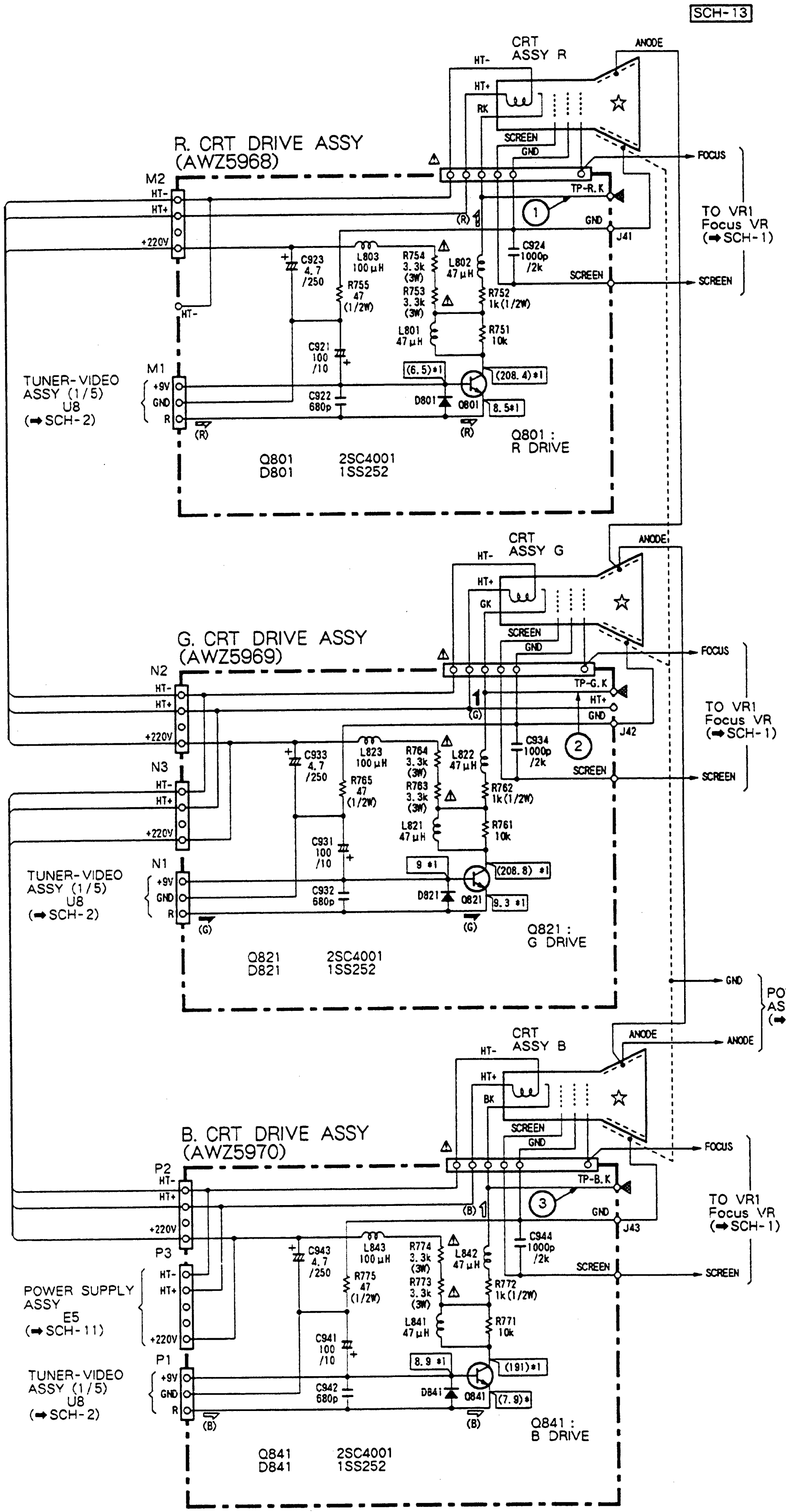
PCB – 5


R CRT DRIVE ASSY
AWV
M1→U8
J104
J103
(ANODE)
POWER SUPPLY
ASSY
TP-R. K
SCREEN
GND
M2→N2
HT. –
RED
AWZ5968
YG-M3
R. SCREEN
R. FOCUS
TO VR1
TUNER-VIDEO
ASSY U8
G CRT DRIVE ASSY
N1→U8
TP-G. K
N3→P2
N2→M2
GND
HT. +
GREEN
AWZ5969
YG-M3
G. SCREEN
G. FOCUS
TO VR1
B CRT DRIVE ASSY
P1→U8
TP-B. K
P2→N3
GND
BLUE
AWZ5970
YG-M3
P3→E5
POWER SUPPLY
ASSY E5
B. SCREEN
B. FOCUS
TO VR1

▨ mark shows a high voltage generation point (excepting the charged section).

- **This diagram is viewed from the mounted parts side.**

SCH-13

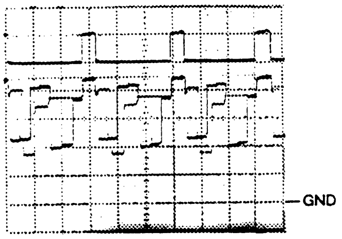

CRT ASSY R
ANODE
HT-
HT+
RK
SCREEN
GND
R. CRT DRIVE ASSY
(AWZ5968)
M2
HT-
HT+
+220V
TP-R.K
①
(R)
GND
J41
FOCUS
TO VR1
Focus VR
(➡SCH-1)
SCREEN
C923 4.7 /250
L803 100μH
R755 47 (1/2W)
R754 3.3k (3W)
R753 3.3k (3W)
L802 47μH
C924 1000p /2k
R752 1k(1/2W)
L801 47μH
R751 10k
C921 100 /10
C922 680p
(6.5)*1
(208.4)*1
8.5*1
D801
Q801
M1
+9V
GND
R
TUNER-VIDEO ASSY (1/5) U8 (➡SCH-2)
Q801 : R DRIVE
Q801 2SC4001
D801 1SS252
CRT ASSY G
G. CRT DRIVE ASSY
(AWZ5969)
N2
GK
TP-G.K
(G)
J42
②
C933 4.7 /250
L823 100μH
R765 47 (1/2W)
R764 3.3k (3W)
R763 3.3k (3W)
L822 47μH
C934 1000p /2k
R762 1k(1/2W)
L821 47μH
R761 10k
C931 100 /10
C932 680p
9 *1
(208.8) *1
9.3 *1
D821
Q821
N3
N1
Q821 : G DRIVE
Q821 2SC4001
D821 1SS252
GND
POWER SUPPLY ASSY
(➡SCH-11)
ANODE
CRT ASSY B
B. CRT DRIVE ASSY
(AWZ5970)
P2
BK
TP-B.K
(B)
③
J43
C943 4.7 /250
L843 100μH
R775 47 (1/2W)
R774 3.3k (3W)
R773 3.3k (3W)
L842 47μH
C944 1000p /2k
R772 1k(1/2W)
L841 47μH
R771 10k
C941 100 /10
C942 680p
8.9 *1
(191)*1
(7.9)*
D841
Q841
P3
POWER SUPPLY ASSY E5 (➡SCH-11)
P1
Q841 : B DRIVE
Q841 2SC4001
D841 1SS252

*1 : DC voltage (V) is measured with the digital voltmeter at no input signal.
Value in ( ) is DC + AC mode.
(R) : R. Signal Route
(G) : G. Signal Route
(B) : B. Signal Route

● **Waveformes**
- Input signal : Color bar
- Picture quqlity : standard
- Range : DC range (Unless otherwise noted.)

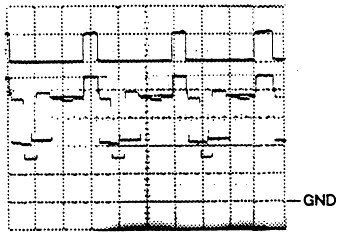
⑲ **Upper: U6 pin H. BLK**
(TUNER-VIDEO ASSY)
V range : 10V/div.
H range : 20 μsec/div.

① **Lower: TP-RK**
V range : 50V/div.
H range : 20 μsec/div.



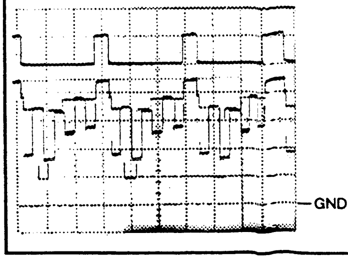
⑲ **Upper: U6 pin H. BLK**
(TUNER-VIDEO ASSY)
V range : 10V/div.
H range : 20 μsec/div.

② **Lower: TP-GK**
V range : 50V/div.
H range : 20 μsec/div.



⑲ **Upper: U6 pin H. BLK**
(TUNER-VIDEO ASSY)
V range : 10V/div.
H range : 20 μsec/div.

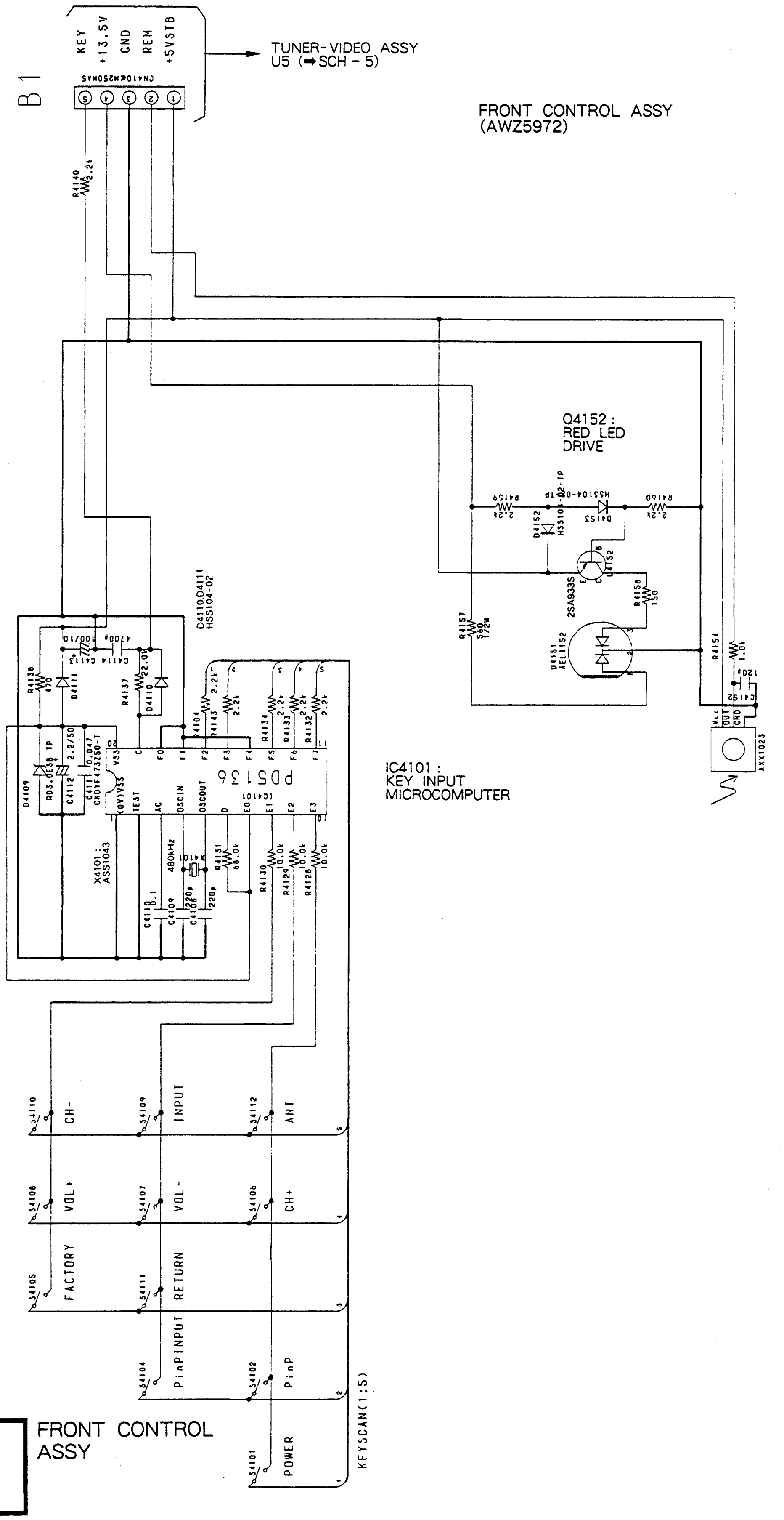
③ **Lower: TP-BK**
V range : 50V/div.
H range : 20 μsec/div.



R. CRT DRIVE ASSY
G. CRT DRIVE ASSY
B. CRT DRIVE ASSY

SCH-13

5.14 FRONT CONTROL ASSY


B1
CN4101
KEY
+13.5V
GND
REM
+5VSTB
TUNER-VIDEO ASSY
U5 (➡SCH – 5)
FRONT CONTROL ASSY
(AWZ5972)
R4140 2.2k
Q4152 :
RED LED
DRIVE
R4159 2.2k
D4152 HSS104-02-TP
D4153 HSS104-02-TP
R4160 2.2k
Q4152 2SA933S
E C B
R4158 150
R4157 560 1/2W
D4151 AEL1152
R4154 1.0k
C4152 120p
Vcc OUT GND
AXX1023
D4110,D4111
HSS104-02
R4138 470
D4111
C4113 100/10
C4114 4700p
R4137 22.0k
D4110
D4109 RD3.0ESB TP
C4112 2.2/50
C4111 0.047
CKDYF473Z50-T
IC4101 PD5136
VSS C F0 F1 F2 F3 F4 F5 F6 F7
(OV)VSS TEST AC OSCIN OSCOUT D E0 E1 E2 E3
R4104 2.2k
R4143 2.2k
R4134 2.2k
R4133 2.2k
R4132 2.2k
IC4101 :
KEY INPUT
MICROCOMPUTER
X4101 :
ASS1043
480kHz
X4101
R4131 68.0k
R4130 10.0k
R4129 10.0k
R4128 10.0k
C4110 0.1
C4109 220p
C4108 220p
S4110 CH-
S4109 INPUT
S4112 ANT
S4108 VOL+
S4107 VOL-
S4106 CH+
S4105 FACTORY
S4111 RETURN
S4104 PinPINPUT
S4102 PinP
S4101 POWER
KEYSCAN(1:5)

A

B

C

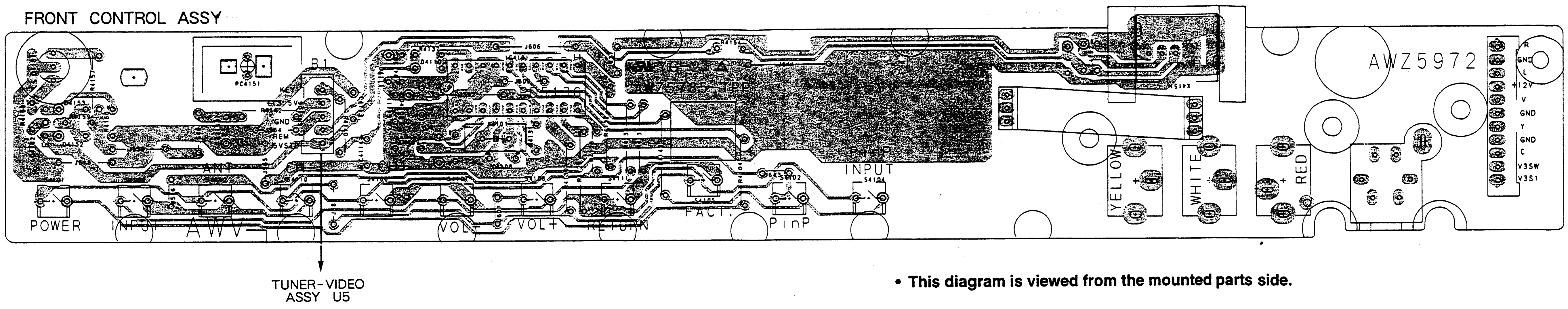
D

SCH-14

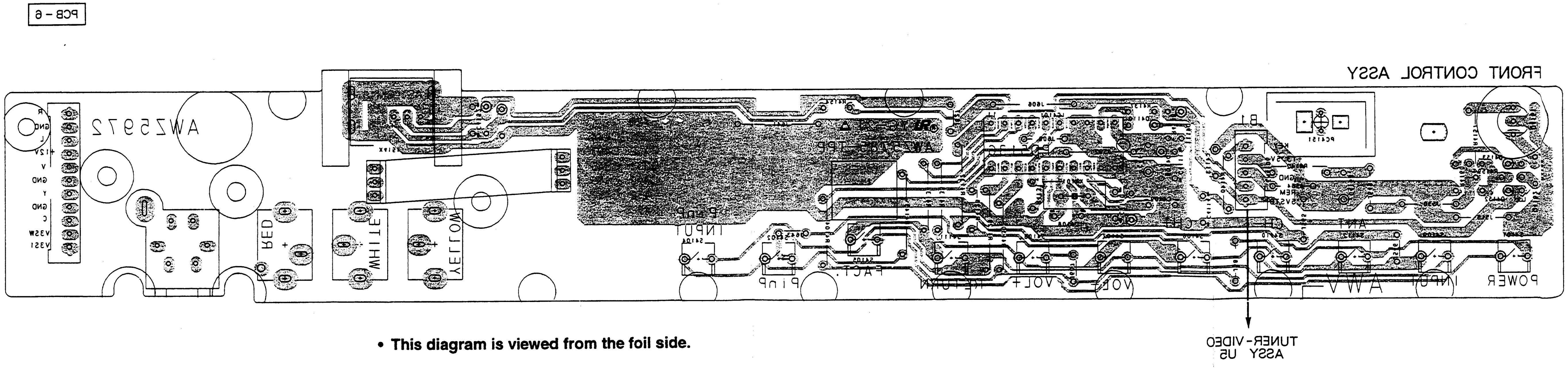
FRONT CONTROL ASSY

PCB – 6

FRONT CONTROL ASSY


AWZ5972
B1
PC4151
KEY
+13.5V
GND
REM
R
GND
L
+12V
V
GND
Y
GND
C
V3SW
V3S1
ANT
POWER
INPUT
AWV
VOL–
VOL+
RETURN
FACT.
PinP
INPUT
YELLOW
WHITE
RED
TUNER-VIDEO ASSY U5

• This diagram is viewed from the mounted parts side.



• This diagram is viewed from the foil side.

6. PCB PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The " ⚠ " mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohms and 47k ohms (Tolerance is shown by J = 5%, and K =10%).

560Ω → 56×10^{1} → 561 ---------- RD1/8PM $\boxed{5}\boxed{6}\boxed{1}$ J
47kΩ → 47×10^{3} → 473 ---------- RD1/4PS $\boxed{4}\boxed{7}\boxed{3}$ J
0.5Ω → 0R5 ---------- RN2H $\boxed{0}\boxed{R}\boxed{5}$ K
1Ω → 010 ---------- RS1P $\boxed{0}\boxed{1}\boxed{0}$ K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ → 562×10^{1} → 5621 ---------- RN1/4PC $\boxed{5}\boxed{6}\boxed{2}\boxed{1}$ F

- *Parts marked by ☆ are important parts which relate in X-rays radiation.*
  If any of these parts need to be replaced, always replace with specified parts.
- *Parts marked by **x** are important parts which relate in X-rays radiation. If a failure occurs in any of these parts, replace the printed circuit board assembly where the relevant part has already been adjusted as a working component. Do not replace the actual part itself. If any part marked by **x** is replaced, there is danger of being exposed to X-rays.*

LIST OF ASSEMBLIS

Mark	No. Description	Parts No.
	TUNER·VIDEO ASSY	AWV1478
NSP	CONVERGENCE ASSY	AWV1480
	├ CONVERGENCE ASSY	AWZ5967
	├ R.CRT DRIVE ASSY	AWZ5968
	├ G.CRT DRIVE ASSY	AWZ5969
	└ B.CRT DRIVE ASSY	AWZ5970
NSP	AV I/O ASSY	AWV1481
	├ AV I/O ASSY	AWZ5971
	├ FRONT CONTROL ASSY	AWZ5972
☆	├ V-AMP ASSY	AWZ5973
	├ POWER SW ASSY	AWZ5974
	├ A CONNECTOR ASSY	AWZ5975
	└ B CONNECTOR ASSY	AWZ5976
☆	POWER SUPPLY ASSY	AWV1496
	TV FRONT-END SYSTEM UNIT	AXF1077
	RF SWITCH	AXF1078

TUNER•VIDEO ASSY

Mark	No. Description	Parts No.
SEMICONDUCTORS		
	IC452	AT24C04-10PC
	IC4901	CXA1734S
⚠	IC302	LA4280-P
	IC303	M5222L
⚠	IC453	MC34064P
⚠	IC253	NJM7809FAS
	IC451	PD5299A
	IC2001	PD5300A
	IC254	TA8801AN
	Q232 -Q234 ,Q238 -Q242 ,Q246	2SA933S
	Q248 ,Q249 ,Q252 ,Q258	2SA933S
	Q260 ,Q261 ,Q268 ,Q270 ,Q275	2SA933S
	Q280 ,Q282 ,Q284 ,Q285 ,Q288	2SA933S
	Q290 ,Q297 ,Q298 ,Q300 ,Q305	2SA933S
	Q307 ,Q401 ,Q402 ,Q454 ,Q4802	2SA933S
	Q4807 ,Q4811 ,Q4812 ,Q487 -Q490	2SA933S
	Q4904	2SA933S
	Q231 ,Q235 -Q237 ,Q243 -Q245	2SC1740S
	Q251 ,Q253 -Q257 ,Q259	2SC1740S
	Q262 -Q267 ,Q269 ,Q271 ,Q272	2SC1740S
	Q276 -Q279 ,Q281 ,Q283 ,Q286	2SC1740S
⚠	Q277	2SC1740S
	Q289 ,Q291 -Q294 ,Q301 -Q304	2SC1740S
	Q306 ,Q308 ,Q403 -Q405	2SC1740S
	Q408 -Q410 ,Q412 ,Q413	2SC1740S
	Q445 ,Q446 ,Q453 ,Q455 ,Q462	2SC1740S
	Q467 ,Q468 ,Q4804 ,Q4806	2SC1740S
	Q4808 -Q4810 ,Q486 ,Q4902 ,Q4903	2SC1740S
	Q461	2SD438
⚠	Q4803	2SD438
	Q406	2SJ103
	Q459 ,Q4801 ,Q4901	XDC124ES
	Q2005 ,Q407 ,Q411 ,Q456	XDC143ES
	Q464 -Q466 ,Q493	XDC143ES
	D2005 ,D2007 ,D2009 ,D2010	HSS104-02
	D2014 ,D2015 ,D2018 -D2021	HSS104-02
	D236 ,D237 ,D239 ,D242 ,D244	HSS104-02
	D247 ,D248 ,D250 ,D253	HSS104-02
	D255 -D258 ,D260 -D263 ,D265	HSS104-02
	D267 ,D269 ,D273 ,D278 -D281	HSS104-02
	D290 ,D292 ,D299 ,D301 -D304	HSS104-02
	D307 -D315 ,D317 -D322 ,D339	HSS104-02
	D341 -D344 ,D430 ,D431	HSS104-02
	D450 -D454 ,D459 ,D461 ,D466	HSS104-02
	D471 -D475 ,D477 ,D478	HSS104-02
	D4801 -D4808 ,D4811 -D4814	HSS104-02
	D251	HZS11A1L
	D4905 ,D4906	MTZJ12
	D231 -D235 ,D238 ,D241 ,D243	MTZJ15
	D245 ,D252 ,D259 ,D264 ,D266	MTZJ15
	D268 ,D270 -D272 ,D274 ,D275	MTZJ15
	D291 ,D293 -D298 ,D300	MTZJ15
	D335 -D338 ,D405 -D409	MTZJ15
	D316	MTZJ5.1
	D2001 -D2004 ,D2006 ,D2008	MTZJ6.8
	D2011 -D2013 ,D2016 ,D2017	MTZJ6.8
	D305 ,D306 ,D401 -D404 ,D411	MTZJ6.8
	D413 ,D414 ,D416 -D429 ,D469	MTZJ6.8
	D479 -D483 ,D486 -D491 ,D493	MTZJ6.8
	D495 -D499	MTZJ6.8
	D4810	RD33ESB3
	D340 ,D460	RD5.1ESB2
	D455	RD5.6ESB2
	D4809	RD5.6ESB3
	D282 -D287	S5688G
COILS AND FILTERS		
	DL253 (DELAY LINE)	ATN1012
	L2001 ,L4902 (BEAD FILTER)	ATX1008
	L254 ,L401	LAU270K
	L4801 ,L4802 ,L4901	LAU2R2K
	L263	LAU390K
	L256	LAU3R9K
	L260 -L262	LAU4R7K
	L4803	LAU560K
	L255 ,L257	LAU8R2K
CAPACITORS		
	C4915 (3.3/50)	ACH1128
	C4918 (10/50)	ACH1129
	C379	CCCCH100D50
	C961	CCCCH150J50
	C4801 ,C4809 -C4811 ,C4815	CCCSL101J50
	C396 -C398	CCCSL121J50
	C335 ,C336 ,C399 -C401	CCCSL151J50
	C334	CCCSL181J50
	C406	CCCSL270J50
	C4817	CCCSL470J50
	C339	CEANP2R2M50
	C341 ,C348 ,C353 ,C4904 ,C4917	CEAS010M50
	C951 ,C953 ,C971 -C975	CEAS010M50
	C2003 ,C2008 ,C460 ,C466 ,C986	CEAS0R1M50
	C347 ,C431 ,C432 ,C4806 ,C4820	CEAS100M50
	C4901 ,C982	CEAS100M50
	C2005 ,C356 ,C4808 ,C956 ,C963	CEAS101M10
	C978	CEAS101M10
	C354 ,C386 ,C403 ,C4909	CEAS101M25
	C352 ,C4812	CEAS102M16
	C481 ,C482	CEAS102M25
	C455	CEAS221M10
	C385 ,C444	CEAS221M16
	C462 ,C467	CEAS221M35
	C331 ,C345 ,C358 ,C360 ,C382	CEAS2R2M50
	C448 ,C449 ,C454 ,C456	CEAS2R2M50
	C452 ,C457	CEAS330M35
	C4826	CEAS331M16
	C985	CEAS3R3M50
	C337 ,C338 ,C340 ,C342 ,C349	CEAS470M25
	C367 ,C433 ,C441 ,C447 ,C4805	CEAS470M25
	C4822 ,C4824 ,C964 ,C987 ,C989	CEAS470M25
	C453	CEAS470M50
	C346	CEAS471M10
	C464	CEAS471M35
	C351 ,C363 ,C4902 ,C4906 -C4908	CEAS4R7M50
	C4911 ,C492 ,C4916 ,C4921 ,C4922	CEAS4R7M50
	C4905	CEASR47M50
	C361 ,C365	CFTXA104J50
	C4903	CFTXA224J50
	C4818	CKCYB102K50
	C958 ,C959 ,C977 ,C984	CKCYB103K50
	C387 ,C4919 ,C4920 ,C955	CKCYB222K50
	C4819	CKCYB471K50
	C2001	CKCYF102Z50
	C362 ,C364 ,C371 ,C376 ,C4802	CKCYF103Z50
	C4804 ,C4813 ,C4823 ,C4825 ,C4910	CKCYF103Z50
	C2006 ,C2012 ,C350 ,C355 ,C357	CKCYF473Z50
	C372 ,C374 ,C375 ,C377 ,C461	CKCYF473Z50
	C463 ,C468 ,C472 ,C480	CKCYF473Z50
	C485 ,C486 ,C952 ,C957 ,C962	CKCYF473Z50
	C965 ,C983 ,C988 ,C992 ,C994	CKCYF473Z50
	C2004	CKCYB561K50
	C451 ,C458	CKMYB151K50
	C445 ,C446	CKMYB471K50
	C2002	CQMA102J50
	C359	CQMA103J50
	C990	CQMA104J50
	C368	CQMA124J50
	C333	CQMA152J50
	C384	CQMA183J50
	C370 ,C373	CQMA223J50
	C4913	CQMA272J50
	C381	CQMA472J50
	C405 ,C4914	CQMA473J50
	TC401 (2.3pF-50pF)	ACM-022
RESISTORS		
	R599	RA5T103J
	R680	RA5T153J
	R2036	RA8T103J
	R2034 ,R2035	RA9T103J
	R1698 ,R1699 ,R1715 ,R1721 ,R1722	RD1/2PM100J
	R4811	RD1/2PM102J
	R817 ,R821	RD1/2PM152J
	R1694	RD1/2PM270J
	R1716 ,R1719 ,R1720	RD1/2PM271J
	R579 ,R580	RD1/4PM221J
	R4810	RD1/4PM391J
	R590	RD1/4PM471J
⚠	R785	RD1/4PMFL150J
	R819	RD1/4PMFL2R2J
⚠	R823	RD1/4PMFL2R2J
	R591 ,R620 ,R687 ,R4851	RD1/4PMFL3R9J
⚠	R687 ,R1556	RD1/4PMFL3R9J
	R4908	RN1/4PC4302F
	R4903	RN1/4PC6202F
⚠	R4809	RS2LMF220J
⚠	R1577	RS2LMF3R3J
⚠	R1561	RS2LMF4R7J
⚠	R838	RS2LMF6R8J
	VR251 (100Ω)	ACP1037
	VR252 (220Ω)	ACP1038
	VR4801 (2.2kΩ)	ACP1041
	Other Resistors	RD1/8PM□□□J
OTHERS		
	X2002 ,X451 (8.00MHz)	ASS1015
	X251 (503kHz)	ASS1019
	X2001 (12MHz)	ASS1062
	X252 (3.579545MHz)	ASS1091
	CN252 ,CN401	KM200IA12
	CN301	KM250MA4
	CN405	KM250MA5
	CN251	KM250MA9
	CN255	KP250NA10
	HEAT SINK	ANH-575
	SHIELD PLATE	ANK1500
	PLATE SPRING	ANG1569
	SCREW	BBZ30P080FCU
	SCREW	PBZ30P080FMC

CONVERGENCE ASSY

Mark	No. Description	Parts No.
SEMICONDUCTORS		
	IC3008-IC3012	NJM4558LD
⚠	IC3001	NJM78M05FAS
⚠	IC3002	NJM79M05FA
	IC3003,IC3004	PA0053B
	IC3005,IC3006	PM0002B
	IC3007	STK4277-SL

Mark	No. Description	Parts No.
	Q3001 ,Q3002	2SA933S
	Q3004 ,Q3006 -Q3008 ,Q3010 ,Q3011	2SC1740S
	Q3013 ,Q3014	2SC1740S
	Q3005 ,Q3009 ,Q3012	2SC3064
	D3001 ,D3002 ,D3009 ,D3028	HSS104-02
	D3053 -D3057	HSS104-02
	D3014 -D3027 ,D3029 ,D3035 -D3037	MTZJ12
	D3039 ,D3040 ,D3042 ,D3044 -D3047	MTZJ12
	D3049 -D3052 ,D3058 -D3060	MTZJ12
	D3011 -D3013 ,D3030 -D3034 ,D3038	MTZJ5.6
	D3041 ,D3043 ,D3048	MTZJ5.6
	D3010	RD4.7ESB2
CAPACITORS		
	C3030 ,C3063	CCMSL101J50
	C3026	CCMSL470J50
	C3028 ,C3029 ,C3034 ,C3056 ,C3082	CEAS010M50
	C3022 ,C3025 ,C3081	CEAS100M50
	C3009 ,C3010 ,C3020 ,C3023 ,C3024	CEAS101M10
	C3037 ,C3040 ,C3041 ,C3044 ,C3045	CEAS101M10
	C3062 ,C3067 ,C3068	CEAS101M10
	C3019	CEAS102M6
	C3001 ,C3002	CEAS220M50
	C3008 ,C3015 ,C3046 ,C3052	CEAS221M10
	C3069 -C3072	CEAS221M35
	C3057 ,C3058	CEAS330M25
	C3003 ,C3004 ,C3059	CEAS470M25
	C3060	CEAS4R7M50
	C3035	CEASR47M50
	C3047 ,C3055	CFTYA224J50
	C3011 -C3014 ,C3016 ,C3018 ,C3021	CKCYF473Z50
	C3031 -C3033 ,C3038 ,C3039	CKCYF473Z50
	C3042 ,C3043 ,C3048 -C3051	CKCYF473Z50
	C3053 ,C3054 ,C3064 -C3066	CKCYF473Z50
	C3073 -C3076	CKCYF473Z50
	C3017	CQMA102J50
	C3006	CQMA103J50
	C3061	CQMA104J50
	C3027	CQMA152J50
	C3007 ,C3036	CQMA471J50
RESISTORS		
	R3154	RD1/2PM224J
	R3074	RD1/2PM274J
	R3062	RD1/2PM334J
⚠	R3167 ,R3168	RD1/2PMFL220J
	R3022	RD1/4PMF270J
⚠	R3172 ,R3173	RS2LMFR47J
⚠	R3184 -R3188	RS3LMF6R8J
⚠	R3001 ,R3002	RT5PZ470K
	VR3001-VR3004 (4.7kΩ)	ACP1042
	VR3006 (47kΩ)	ACP1045
	VR3005 (220kΩ)	ACP1047
	Other Resistors	RD1/8PM□□□J
OTHERS		
	BINDER	AEP-215
	CN3005	KM250MA4
	CN3001	KM250MA8R
	SHIELD PLATE	ANK1500
	HEAT SINK	ANH1482
	SCREW	ABA1056
	SCREW	BBZ30P080FCU
	SCREW	BBZ30P080FZK
	SCREW	PBZ30P080FMC

R.CRT DRIVE ASSY

Mark	No. Description	Parts No.
SEMICONDUCTORS		
	Q801	2SC4001
	D801	HSS104-02
COILS		
	L803	LAU101K
	L801 ,L802	LAU470K
CAPACITORS		
	C924 (1000p/2kV)	ACG1001
	C921	CEAS101M10
	C922	CKCYB681K50
RESISTORS		
	R755 (47Ω,1/2W)	ACN-225
	R752 (1kΩ,1/2W)	ACN1006
⚠	R753 ,R754	RS3LMF332J
	Other Resistors	RD1/8PM□□□J
OTHERS		
⚠	CRT SOCKET	AKG1004
	CN8013	KM250MA3R
	HEAT SINK M3	ANH1409
	SCREW	PMB30P100FMC

G.CRT DRIVE ASSY

Mark	No. Description	Parts No.
SEMICONDUCTORS		
	Q821	2SC4001
	D821	HSS104-02
COILS		
	L823	LAU101K
	L821 ,L822	LAU470K
CAPACITORS		
	C934 (1000p/2kV)	ACG1001
	C933 (4.7/250)	ACH-378
	C931	CEAS101M10
	C932	CKCYB681K50
RESISTORS		
	R765 (47Ω,1/2W)	ACN-225
	R762 (1kΩ,1/2W)	ACN1006
⚠	R763 ,R764	RS3LMF332J
	Other Resistors	RD1/8PM□□□J
OTHERS		
⚠	CRT SOCKET	AKG1004
	CN8020	KM250MA3
	HEAT SINK M3	ANH1409
	LEAD WITH HOUSING	ADX1508
	SCREW	PMB30P100FMC

B.CRT DRIVE ASSY

Mark	No. Description	Parts No.
SEMICONDUCTORS		
	Q841	2SC4001
	D841	HSS104-02
COILS		
	L843	LAU101K
	L841 ,L842	LAU470K
CAPACITORS		
	C944 (1000p/2kV)	ACG1001
	C941	CEAS101M10
	C942	CKCYB681K50
RESISTORS		
	R775 (47Ω,1/2W)	ACN-225
	R772 (1kΩ,1/2W)	ACN1006
⚠	R773 ,R774	RS3LMF332J
	Other Resistors	RD1/8PM□□□J
OTHERS		
⚠	CRT SOCKET	AKG1004
	CN8027	KM250MA3B
	CN8028	KM250MA5
	HEAT SINK M3	ANH1409
	SCREW	PMB30P100FMC

AV I/O ASSY

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	IC3501		HA11569FS
	IC3502		HD49412FS
	IC3503		HM53461ZP-12
	IC3504		M66320P
⚠	IC3505		NJM7805FAS
	IC1001,IC1002		TC4051BP
	IC1003		TC4052BP
	Q1002 ,Q1021 ,Q3506		2SA933S
	Q1001 ,Q1003 -Q1007 ,Q1009 -Q1020		2SC1740S
	Q1025 ,Q1026 ,Q3501 -Q3505		2SC1740S
	Q3701 ,Q3702		2SC1740S
	Q1008 ,Q1022 -Q1024 ,Q1027		XDC124ES
	Q3510 -Q3512		XDC124ES
	D1001 ,D3504 -D3506 , D3508		HSS104-02
	D3701 -D3706		HSS104-02
	D1005 -D1013 ,D1017 ,D1018		MTZJ15
	D3501 -D3503 ,D3507		MTZJ6.8
COILS AND FILTERS			
	F3501	(F=14.3MH)	ATF1166
	F3502	(F=16.1MH)	ATF1167
	L3521	(1000 μH)	ATH1046
	DL3501		ATN1022
	L3520 ,L3522		ATX1008
	L3502 ,L3510		LAU101J
	L3517		LAU150J
	L3507		LAU181K
	L3515		LAU220J
	L3512		LAU470J
	L3503 -L3506 ,L3516 ,L3518 ,L3519		LAU4R7J
	L3508		LAU680J
CAPACITORS			
	C3538 ,C3561 ,C3568		CCCCH100D50
	C3576		CCCCH150J50
	C3539 ,C3542 ,C3562		CCCCH220J50
	C3550		CCCCH470J50
	C3601		CCCCH560J50
	C3536 ,C3569 ,C3571 ,C3573 ,C3582		CCCSL101J50
	C3574		CCCSL150J50
	C3505 ,C3533 ,C3570 ,C3581		CCCSL151J50
	C3528 ,C3578		CCCSL220J50
	C3509 ,C3572		CCCSL330J50
	C3526		CCCSL470J50
	C3588		CCCSL820J50
	C1019		CEANP101M10
	C1006 ,C1007 ,C1011 -C1016 ,C3502		CEAS010M50
	C3549 ,C3551 ,C3584 ,C3585 ,C3593		CEAS010M50
	C3577 ,C3580 ,C3595 ,C3598 -C3600		CEAS0R1M50
	C3506 ,C3507 ,C3511 ,C3518 ,C3547		CEAS100M50
	C3553 ,C3564 ,C3566 ,C3567		CEAS100M50
	C3590 -C3592 ,C3602 ,C3603 ,C3605		CEAS100M50
	C3611		CEAS100M50
	C3503 ,C3515 ,C3606		CEAS101M10
	C1001 ,C1003 ,C1024 ,C1025 ,C1031		CEAS101M25
	C3701 ,C3702		CEAS101M25
	C1022		CEAS102M16
	C1005 ,C1008 ,C1009 ,C1026 -C1028		CEAS220M50
	C3521 -C3523 ,C3544 ,C3559		CEAS2R2M50
	C1010 ,C1021 ,C3596		CEAS470M25
	C1039 ,C3501		CEAS471M16
	C3520 ,C3530 ,C3531 ,C3555		CEAS4R7M50
	C3517 ,C3535 ,C3541 ,C3558		CEASR22M50
	C3552		CEASR47M50
	C3514 ,C3543 ,C3546		CKCYB102K50
	C3534 ,C3560 ,C3579 ,C3609		CKCYB103K50
	C3583		CKCYB471K50
	C3525		CKCYB681K50
	C1002 ,C1004 ,C1017 ,C1018 ,C1020		CKCYF473Z50
	C1023 ,C1029 ,C1030 ,C1033 -C1038		CKCYF473Z50
	C3508 ,C3510 ,C3516 ,C3519 ,C3548		CKCYF473Z50
	C3554 ,C3563 ,C3565 ,C3589 ,C3594		CKCYF473Z50
	C3597 ,C3604 ,C3608 ,C3610		CKCYF473Z50
	C3703 -C3705		CKCYF473Z50
	C3504 ,C3537		CKCYX103M16
	C3607		CKCYX104M16
	C3545 ,C3557		CKCYX333M16
	C3527		CKCYX683M16
	C3512 ,C3532		CQMA152J50
	C3513 ,C3529		CQMA561J50
RESISTORS			
	R1069		RD1/2PM221J
⚠	R3701		RD1/2PM330J
⚠	R1100		RD1/2PMFL3R9J
	R1004		RD1/4PM750J
	VR3502,VR3503	(470Ω)	ACP1039
	VR3501	(4.7kΩ)	ACP1042
		Other Resistors	RD1/8PM□□□J
OTHERS			
	CN1002	PIN JACK (9P)	AKB1199
	CN3501		KM250NA10L
		SHIELD CASE	ANK1202
		SHIELD PLATE	ANK1203
		HEAT SINK M	ANH-697
	X3503 ,X3504	(3.579545MHz)	ASS1091
	X3501 ,X3502	(503kHz)	ASS1112
		COMB FILTER MODULE	AXX1045
		SCREW	PBZ30P080FMC

FRONT CONTROL ASSY

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	IC4101		PD5136
	Q4152		2SA933S
	D4151		AEL1152
	D4110 ,D4111 ,D4152 ,D4153		HSS104-02
	D4109		MTZJ3.0
SWITCHES			
	S4101 ,S4102 ,S4104 -S4112		ASG1034
CAPACITORS			
	C4108 ,C4109		CCCCH221J50
	C4152		CCCSL121J50
	C4113		CEAS101M10
	C4112		CEAS2R2M50
	C4114		CKCYB472K50
	C4111		CKCYF473Z50
	C4110		CKCYX104M16
RESISTORS			
	R4157		RD1/2PMF561J
		Other Resistors	RD1/8PM□□□J
OTHERS			
	X4101	(480kHz)	ASS1043
		REMOTE RECEIVER UNIT	AXX1023
	CN4106		KM250MA5

☆ V-AMP ASSY

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	IC201 -IC203		NJM4558DXP
	Q201 -Q203 ,Q206 ,Q210		2SC1740S
	Q204 ,Q205		2SC3064

Mark	No.	Description	Parts No.
	D202 ,D203 ,D207		HSS104-02
	D201 ,D204		RD15ESB3
CAPACITORS			
	C288		CEANP100M35
	C274 ,C280		CEAS100M50
	C289		CEHAQ221M10
	C273		CEHAQ470M16
	C271		CKCYB222K50
	C272 ,C275 -C278		CKCYF473Z50
	C279		CQMA102J50
RESISTORS			
X	R354 ,R357		
	Other Resistors		RD1/8PM☐☐☐J
OTHERS			
	CN201		KP2001A10L

POWER SW ASSY

Mark	No.	Description	Parts No.
SWITCHES			
	S4201		ASG1006
OTHERS			
	CN4201		AKM-089

A CONNECTER ASSY

Mark	No.	Description	Parts No.
OTHERS			
	CN561 ,CN562		KP200IA12L
	CABLE HOLDER		AKT1007
	CABLE HOLDER		AKT1011

B CONNECTER ASSY

Mark	No.	Description	Parts No.
OTHERS			
	CN563 ,CN564		KP200IA12L
	CABLE HOLDER		AKT1007
	CABLE HOLDER		AKT1011
	JUMPER WIRE		D15A11-075-2468

☆POWER SUPPLY ASSY

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
⚠	IC102		ON3171-Q
⚠	IC101		PC817AB
	Q169 ,Q172		2SA1145
	Q186		2SA1237
	Q101 ,Q110 ,Q159 ,Q165		2SA933S
	Q167 ,Q168 ,Q170		2SA933S
X	Q167 ,Q170		
⚠	Q106		2SB824
⚠	Q191		2SB950A
	Q102 -Q104 ,Q107 ,Q112		2SC1740S
	Q151 -Q153 ,Q158 ,Q166 ,Q173		2SC1740S
	Q187 ,Q188		2SC1740S
	Q189		2SC1845
	Q108 ,Q176		2SC2705
⚠	Q175		2SC3332
⚠	Q105		2SC3451
⚠	Q157		2SC4256
⚠	Q177		2SC4747
⚠	Q109 ,Q171		2SD1276A
⚠	Q111 ,Q174 ,Q190		2SD1276A
⚠	D114 ,D116		11DF1FD
⚠	D168		11DF2FD

Mark	No.	Description	Parts No.
⚠	D102 ,D103 ,D105 ,D106		1SS145
⚠	D170		CTU-G2DR
⚠	D171 ,D174		ES1F
	D178		ES1F
⚠	D123		FMP-G12S
	D107 -D113 ,D115 ,D117 -D119		HSS104-02
	D121 ,D151 ,D152 ,D155 -D157		HSS104-02
	D159 -D161 ,D163 ,D165 -D167		HSS104-02
	D179 ,D182 -D185 ,D187		HSS104-02
	D129		HZS18-1L
	D127		HZS6A1L
	D104 ,D128 ,D130		HZS6B1L
	D120		HZS6C2L
X	D153		
	D175		MTZJ15
⚠	D173		RD39ESB4
⚠ X	D158		
X	D188		
⚠	D126 ,D169		RG4A
⚠	D122		RL2Z
⚠	D124		RL4Z
	D172		RU1
⚠	D101		S5VB60F
COILS			
⚠	L101 ,L102 (2mH)		ATF1118
	L103 (1H μ)		ATH-133
	L151		ATL1085
	L153		ATL1103
	L104 -L109		ATX1023
	L154		LTA272J
TRANSFORMERS			
⚠	T102		ATK1064
⚠	T101		ATT1194
⚠	T152		ATK1045
⚠ X	T151		
RELAYS			
⚠	RY102		ASR1027
⚠	RY101		ASR1036
CAPACITORS			
⚠	C101 (0.1/AC250)		ACE-507
⚠	C105 ,C106 ,C108 ,C109 (6800p/AC250)		ACE1009
⚠	C102 (0.22/AC250)		ACE1104
	C133 (100p/2kV)		ACG-032
	C118 ,C124 (1000p/2kV)		ACG-040
	C209 (0.01/1kV)		ACG-045
	C246 (220p/2kV)		ACG-050
⚠	C110 ,C111 ,C113 ,C114 (0.1/AC250)		ACG-501
	C245 (1000p/2kV)		ACG1001
	C126 (3300p/2kV)		ACG1008
	C234 (680p/2kV)		ACG1024
	C119 (4.7/250)		ACH-378
	C232 (10/160)		ACH1117
	C122 (47/100)		ACH1132
	C136 (560/160)		ACH1146
	C116 (470/200)		ACH1147
	C117 (820/200)		ACH1148
	C220 ,C227 ,C229		CCCSL101K500
	C252 ,C259		CCCSL151J50
	C120 ,C123 ,C130 ,C131		CCCSL221K500
	C128 ,C148 ,C207		CEAS010M50
	C112 ,C146 ,C251		CEAS100M50
	C218		CEAS101M10
	C103		CEAS102M25
	C150		CEAS221M16
	C142		CEAS331M35
	C107 ,C115 ,C199		CEAS470M25

Mark	No.	Description	Parts No.
	C247		CEAS4R7M50
	C231		CEHAQ010M50
	C224		CEHAQ100M2C
	C145 ,C149 ,C214 ,C223 ,C236		CEHAQ100M50
	C255		CEHAQ100M50
	C262		CEHAQ101M10
	C225		CEHAQ101M16
	C235		CEHAQ220M2C
	C244		CEHAQ220M50
	C216 ,C226		CEHAQ221M10
	C215		CEHAQ221M16
	C135 ,C138		CEHAQ222M35
	C134		CEHAQ332M35
	C129		CEHAQ471M16
	C253 ,C254		CEHAQ471M35
	C238		CFPHW123H3D
	C237		CFPHW153H3A
	C202		CFPHW472H3D
⚠	C241		CFPMW155J2D
	C239		CFPMW824J2D
	C121		CFTXA474J50
	C210		CFTYA474J50
	C233		CKCYB102K50
	C230		CKCYB102K500
	C201		CKCYB103K50
	C257		CKCYB122K50
	C258		CKCYB152K50
	C243		CKCYB182K500
	C228		CKCYB222K500
	C261		CKCYB331K50
	C147 ,C260		CKCYB681K50
	C104 ,C125 ,C219		CKCYF103Z50
	C140 ,C141 ,C144 ,C211 ,C242		CKCYF473Z50
	C139 ,C143		CKDYF103Z500
	C221		CQMA103J50
	C203		CQMA104J50
	C127		CQMA123J50
	C213		CQMA223J50
	C240		CQMA473J50
	C208		CQMA683J50
RESISTORS			
⚠	R102 ,R103	(2.2MΩ,1/2W)	ACN-208
	R207	(47Ω,1/2W)	ACN-225
	R208	(33kΩ,1/2W)	ACN1011
⚠	R111 ,R113 ,R124 ,R144 ,R292	(1Ω,5W)	ACN1032
	R131 ,R310 -R312		RD1/2PM101J
	R204		RD1/2PM122J
	R127 ,R129		RD1/2PM241J
	R285		RD1/2PM361J
	R298		RD1/2PM391J
⚠	R281		RD1/2PMFL222J
	R205		RD1/2PMFL562J
⚠	R320		RD1/2PMFL562J
⚠	R122		RD1/4PMFL101J
⚠	R295		RD1/4PMFL2R2J
⚠	R238 ,R271 ,R273		RD1/4PMFL3R9J
⚠	R280 ,R293		RD1/4PMFL470J
⚠	R288		RD1/4PMFL471J
⚠	R125		RD1/4PMFL682J
	R300		RN1/2PC3602F
	R299		RN1/2PC3902F
	R133 ,R135		RN1/4PC1603F
	R155		RN1/4PC2101F
	R156		RN1/4PC2431F
	R132		RN1/4PC3601F
⚠	R308		RS1LMF010J

Mark	No.	Description	Parts No.
⚠	R309		RS1LMF010J
⚠	R157		RS1LMF120J
⚠	R294		RS1LMF220J
⚠	R304 ,R305		RS1LMF331J
⚠	R117		RS1LMF473J
⚠	R226		RS1LMF562J
⚠	R291		RS1LMF563J
⚠	R321 ,R324 ,R325		RS2LMF010J
⚠	R215		RS2LMF123J
⚠	R203 ,R221		RS2LMF153J
⚠	R142		RS2LMF223J
⚠	R159		RS2LMF4R7J
⚠	R120 ,R121		RS2LMFR33J
⚠	R216 ,R217		RS3LMF104J
⚠	R158		RS3LMF181J
⚠	R287		RS3LMF682J
⚠	R136 ,R137		RT10PZ180K
⚠	R123		RT10PZ6R8K
	R202 ,R276		RT5PZ820K
X	VR151		
	VR154		VRTB6VS223
	VR181		VRTB6VS471
X	VR152		
	VR101		VRTS6VS102
X	R237		
X	R235		
X	R250		
X	R255 ,R264 ,R274		
X	R268		
X	R278		
X	R290		
X	R291		
X	R297		
X	R306		
		Other Resistors	RD1/8PM☐☐☐J
OTHERS			
⚠	FU103 ,FU105	(6.3A/125V)	AEK-309
⚠	FU101	(8A/125V)	AEK1002
⚠	FU106	(4.0 A/125V)	AEK1018
⚠	CN102		AKM-089
	CN153 -CN155		AKM1072
	CN103 ,CN151		KM200IA12
	CN152		KM250MA5
		PLUG 3-P	AKM1055
		PLUG 10-P	KM2001A10
		MICA SHEET	AEP-056
		HEAT SINK	ANH-575
		HEAT SINK	ANH1371
		HEAT SINK M	ANH-697
		SW HEAT SINK	ANH1505
		FUSE CLIP	AKR1003
		SHIELD COVER	ANH1166
		SCREW	ABA-234
		SCREW	BBZ30P080FCU
		SCREW	PBZ30P060FMC
		SCREW	PBZ30P080FMC
		SCREW	VPZ40P100FMC

7. ADJUSTMENTS

When adjusting the convergence,use of another remote control unit having DISPLAY and MTS keys and separate INPUT SELECTOR keys for LD,TV and VIDEO 1,such as AXD1352 (CU-SD076) supplied with the SD-P5073-K or AXD1351 (CU-SD075) supplied with the SD-P5075-K,in addition to the supplied remote control unit will improve the operability.

- In this section,all items required to be adjusted on this unit are described in the order of the adjustments to be performed. (See section 7.2)
  For the adjustment items of each assembly,see section 7.1.
- When replacing the assemblies,be sure to use an assmbly which works completely.
- Characters in parentheses ( ) beside an adjustment point are an abbreviation of the assembly containing that adjustment point.
  - A : AV I/O ASSY
  - C : CONVERGENCE ASSY
  - S : POWER SUPPLY ASSY
  - T : TUNER-VIDEO ASSY
  - VR1 : Focus variable resistor(VR1)
- The adjustment points and test points are shown in Fig.7-6 and 7-7 for each assembly.
- A test signal should be input to the laser disc terminal on the rear panel unless otherwise noted.
- Set the picture quality to standard unless otherwise noted.

● FACTORY ADJ mode

1.Entering FACTORY ADJ mode

The FACTORY ADJ mode of this unit is divided into the 1st FACTORY ADJ mode fro performing adjustments and 2nd FACTORY ADJ mode used in the manufacturing process of the factory.
Each time the S4105 switch is pressed through the small hole at the center of the front panel with a thin stick, the mode will change cyclically as follows.

Nomal mode → 1st. FACTORY ADJ mode
*Nomal mode
(TV AIR mode is always selected)
↑ 2nd. FACTORY ADJ mode ←

* : When the mode is changed from FACTORY ADJ mode into nomal mode, the items are changed into the following;

● INPUT SELECTOR : TV
★ TV-CATV mode : AIR
★ Antenna selector : A
★ Closed caption and P IN P : OFF
● Picture quality : 0
● Password code for channel lock : 0000
(For the password code,see page 132)
● Cnvergence adjustment:Initial position of user adjustment

Note:
The items marked with ★ are changed into the previous position when the MAIN POWER SW is OFF or AC power plug is unplugged from a wall socket.

The 2nd FACTORY ADJ mode is used in the factory and not for servicing.

2. Operating 1st. FACTORY ADJ mode

When the unit enters 1st. FACTORY ADJ mode,ADJUSTMENT RANGE mode is first obtained.Every time the MUTE key on the remote control unit is pressed,the operation mode is switched from ADJUSTMENT RANGE mode to ADJUSTMENT OFFSET mode,ADJUSTMENT CONVERGENCE mode(not used),ADJUSTMENT GAME mode and ADJUSTMENT MPX mode,as shown in Fig.7-4.These modes are switched cyclically.
By pressing the following keys, the ADJUSTMENT mode can be switched directly.

● MENU key : ADJUSTMENT RANGE mode
● ▼key : ADJUSTMENT OFFSET mode
● SET key : ADJ CONVERGE mode
● P IN P key : ADJUSTMENT MPX mode
● ◀key : not used (ADJ CONVERGE AUTO)

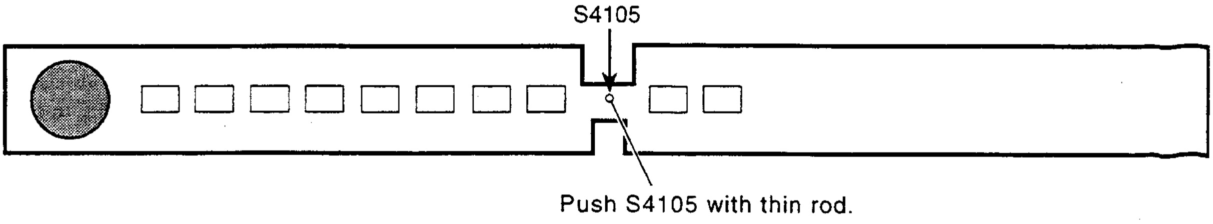


Fig.7-1 Entering FACTORY ADJ mode

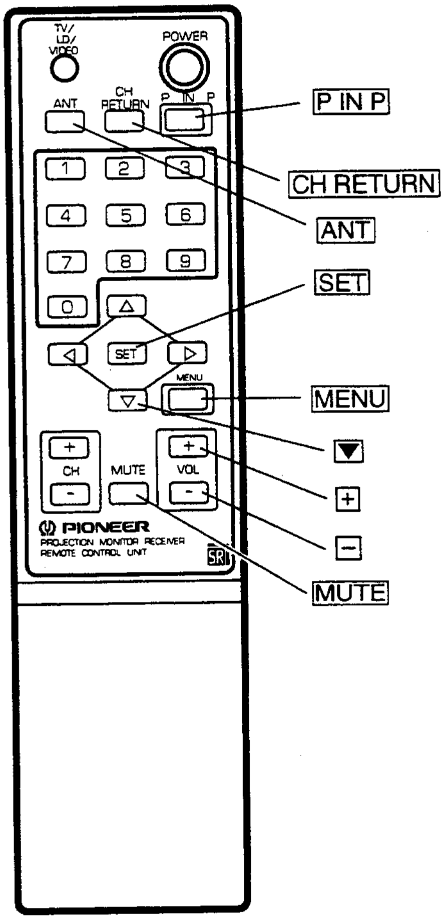


Fig. 7-2 Key indications on the remote control unit

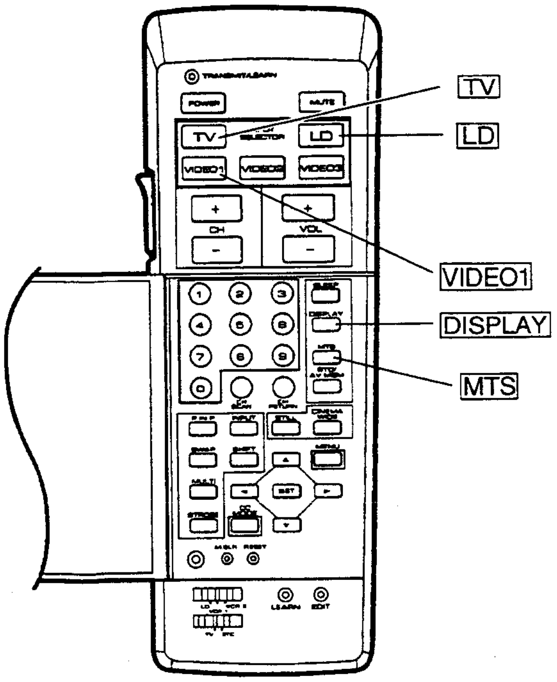


Fig. 7-3 Key indications on the remote control unit of AXD1352(CU-SD076)
(The upper cover is opened.)

①ADJUSTMENT RANGE mode

The ADJUSTMENT RANGE mode is to check how much the picture and sound quality change.

● Function of the ADJUSTMENT RANGE mode

In this mode,adjustment functions are assigned to the numeric keys $\boxed{1}$ through $\boxed{5}$ of the remote control unit,as shown in Fig.7-4.Each numeric key corresponds to a particular adjustment function.Press the numeric key corresponding to the desired function and the selected function name will be displayed.To change the setting value,press the same key repeatedly and the setting value will change from CNT to MIN and MAX cyclically.When the TINT adjustment is selected,the meaning of the setting values change as follows:

● TINT

CNT :Center
↓
MIN :The color to purple
↓
MAX :The color to green

By pressing the numeric keys $\boxed{7}$ to $\boxed{9}$ and $\boxed{0}$, the VOLUME can be set to the following values.

$\boxed{7}$ Key : VOL20
$\boxed{8}$ Key : VOL30
$\boxed{9}$ Key : VOL40
$\boxed{0}$ Key : VOL 0

②ADJUSTMENT OFFSET mode

(PIONEER's standard setting mode)

ADJUSTMENT OFFSET mode is to set the standard picture quality (**PIONEER**'s standard)for a normal picture.

● Function of the ADJUSTMENT OFFSET mode

To adjustment picture quality,press one of the numeric keys $\boxed{1}$ through $\boxed{5}$,and an item to be adjusted such as color,sharpness,etc.,assigned to the pressed button is selected and will appear on the screen,as shown in Fig.7-4. To change the setting value,press the VOL ($\boxed{+}$, $\boxed{-}$) keys until the desired value appears on the screen.

The picture quality set in this mode is the standard picture quality which appears by pressing the $\boxed{\text{STD/AV MEM}}$ key with a normal picture.

③ADJ.CONVERGENCE mode

ADJ.CONVERGENCE mode is for setting convergence.
For details,see section "7.4 CONVERGENCE ADJUSTMENTS."

④ADJUSTMENT GAME mode

ADJUSTMENT GAME mode is to set the standard for GAME for a normal picture.

● Function of the ADJUSTMENT GAME mode

The method of adjustment is the same as that for ②ADJUSTMENT OFFSET mode,mentioned above,except for the setting values.
The picture quality when setting the GAME mode with a normal picture.

⑤ADJUSTMENT MPX mode

This mode is used for adjusting the TV tuner MPX decoder section.

①(Press MENU key)
Mode for checking the change of picture quality,VOLUME,etc.
(Telop : red)

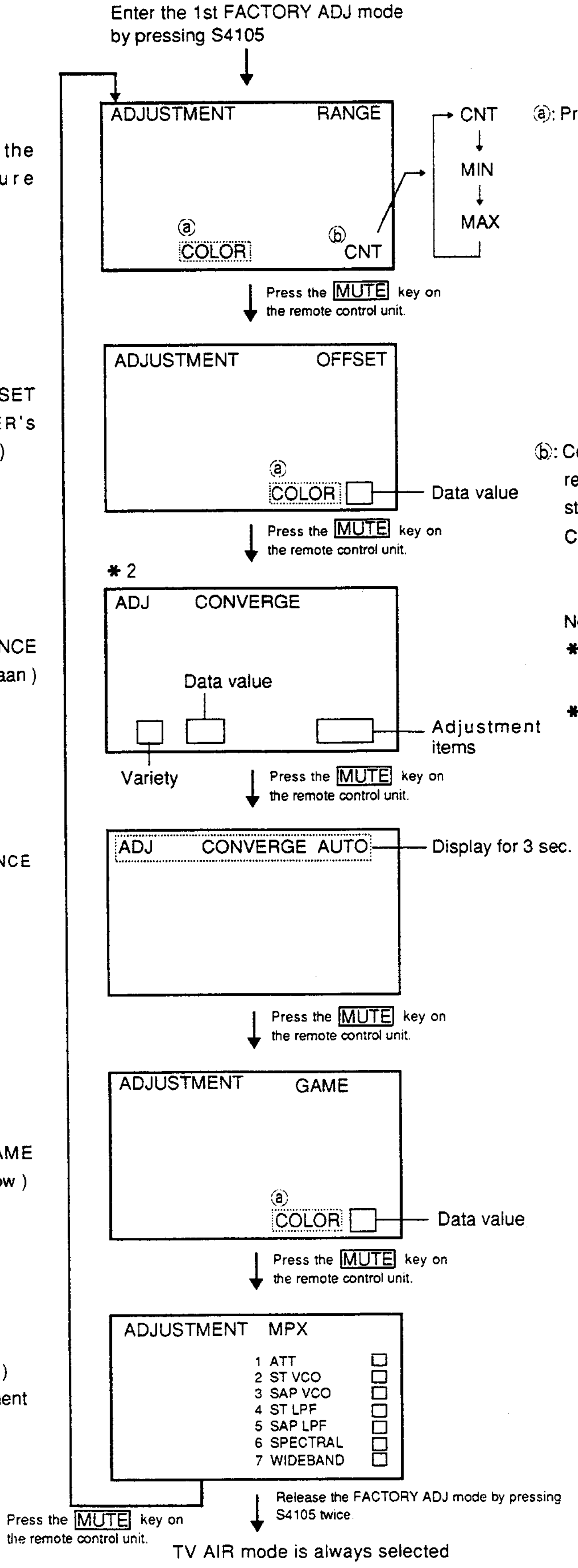
②(Press ▼ key)
Mode for setting OFFSET standard (PIONEER's standard)(Telop : Blue)

③(Press SET key)
Mode for CONVERGENCE adjustment (Telop : Cyaan)

Mode for CONVERGENCE AUTO adjustment
(Not used)

④
Mode for setting GAME standard (Telop : Yellow)

⑤(Press P IN P key)
Mode for MPX adjustment
(Telop : Magenta)


Enter the 1st FACTORY ADJ mode by pressing S4105
ADJUSTMENT RANGE
ⓐ COLOR
ⓑ CNT
CNT
MIN
MAX
Press the MUTE key on the remote control unit.
ADJUSTMENT OFFSET
ⓐ COLOR
Data value
Press the MUTE key on the remote control unit.
✱ 2
ADJ CONVERGE
Data value
Variety
Adjustment items
Press the MUTE key on the remote control unit.
ADJ CONVERGE AUTO
Display for 3 sec.
Press the MUTE key on the remote control unit.
ADJUSTMENT GAME
ⓐ COLOR
Data value
Press the MUTE key on the remote control unit.
ADJUSTMENT MPX
1 ATT
2 ST VCO
3 SAP VCO
4 ST LPF
5 SAP LPF
6 SPECTRAL
7 WIDEBAND
Press the MUTE key on the remote control unit.
Release the FACTORY ADJ mode by pressing S4105 twice
TV AIR mode is always selected

ⓐ: Press the numeric key on the remote control unit.

1 : COLOR
2 : TINT
3 : CONTRAST
4 : BRIGHT
5 : SHARPNESS
7 : VOL 20 ✱ 1
8 : VOL 30 ✱ 1
9 : VOL 40 ✱ 1
0 : VOL 0 ✱ 1

ⓑ: Continuously press the same numeric key on the remote control unit as that pressed in the previous step.The setting value will change from...
CNT → MIN(minimum) → MAX(maxmum)
cyclically

Note;
✱ 1: VOL20, VOL30, VOL40 and VOL0 function in ADJUSTMENT RANGE mode only.
✱ 2: Press MTS key on the remote control unit so that the contrast is changed to + 10dB and − 20dB cyclically.

Fig. 7-4 Operating FACTORY ADJ mode

7.1 ADJUSTMENTS REQUIRED WHEN AN ASSEMBLY IS REPAIRED OR REPLACED

Note: For the method of adjustment,see section "7.2 Adjustment method." A number in parentheses indicates the step number in section "7.2 Adjustment method."

7.1.1 When POWER SUPPLY ASSY was Repaired

1. (Step 1) 135V power supply adjustment
2. (Step 7) Focus VR adjustment
3. (Step 8) Vertical size adjustment
4. (Step 9) Horizontal size adjustment
5. (Step 10) Convergence adjustment
6. (Step 11) White balance adjustment

7.1.2 When POWER SUPPLY ASSY was Replaced

- Adjustments of (Step 8) , (Step 9) , (Step10) and (Step11)

7.1.3 When TUNER-VIDEO ASSY was Repaired

(1)When the video block was repaired

1. (Step3) Brightness adjustment
2. (Step11) White balance adjustment
3. (Steps14through17) Pioneer's standard settings

(2)When the microcomputer block was repaired

1. (Step2) Contrasut coarse adjustment
2. (Step3) Brightness adjustment
3. (Step12) Test-cross H-center position adjustment
4. (Step14 throgh17) Pioneer's standard settings
5. (Step18) Picture quality settings for GAME

Reset the other items such as the tuner preset channels,convergence,etc. which should be set by the user.

(3)When the tuner block was repaired

1. (Step13)Tuner block adjustment

(4)When the audio block was repaired

No adjustment is required.

7.1.4 When TUNER-VIDEO ASSY was Replaced

All the above adjustments except for the test-cross H-center position adjustment and tuner adjustment are required.

7.1.5 When CONVERGENCE ASSY was Repaired or Replaced

- (Step10)Convergence adjustment

7.1.6 When R.,G.or B.CRT DRIVE ASSY was Repaired or Replaced

- Check the white balance.If the white balance is not correct,perform white balance adjustment (Step11).

7.1.7When AV I/O ASSY was Repaired

1. (Step19) Y-signal level adjustment of sub-picture
2. (Step20) TINT adjustment of sub-picture
3. (Step21) Color level adjustment of sub-picture
4. (Step22) Write clock adjustment
5. (Step23) Read clock adjustment

7.1.8 When AV I/O ASSY was Replaced

- No adjustment is required

7.1.9 When CRT ASSY R,G or B was Replaced

Note:

- For details on replacing a CRT ASSY,see section "8. Replacing the CRT ASSY."
- When one or two tubes were replaced,perform the adjustment referring to the tube not replaced.If a CRT ASSY for a color other than green was replaced,be sure to adjust the following items referring to the green.

1. (Step4) Deflection yoke lean adjustment
2. (Step5) Screen center adjustment
3. (Step7) Focus VR adjustment
4. (Step10) Convergence adjustment
5. (Step11) White balance adjustment
6. (Step14 through 17) Pioneer's standard settings

7.1.10 When Lens ASSY was Replaced

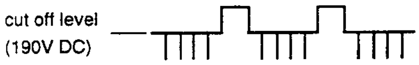
1. (Step6) Focus adjustment of Lens assembly
2. (Step10) Convergence adjustment

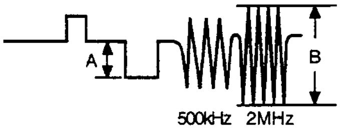
7.1.11 When Other ASSY was Repaired or Replaced

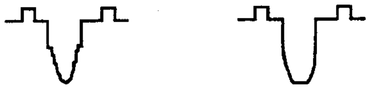
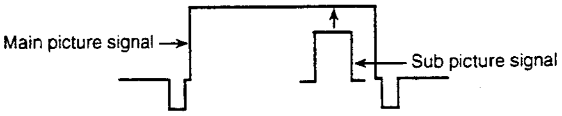
- No adjustment is required.

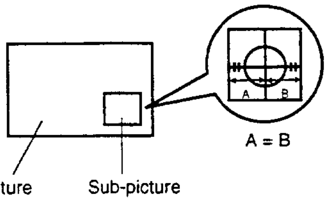
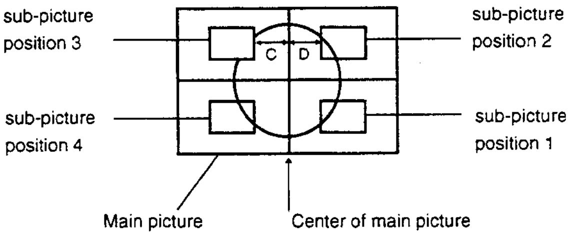
7.2ADJUSTMENT METHOD

- Adjustment points and test points are shown in Fig.7-6 and 7-7.
- Perform the adjustment for standard picture quality unless otherwise noted.
- For information on 1st FACTORY ADJ mode,see pages 81 through 83.

STEP NO.	Adjustment Item		Input Signal	Adjustment point	Adjustment Prdcedure
1	135V power supply adjustment		Color bar	VR101(S)	Adjust the voltage at both sides of C136 on the POWER SUPPLY ASSY to 135V ± 1V.
2	Contrasut coarse adjustment		—	CONTRAST (remote control unit)	Note:Perform this adjustment only when a data memory IC (IC452:AT24C04-10PC) on a TUNER-VIDEO ASSY was replsced or when the contrast of ADJUSTMENT OFFSET in FACTORY ADJ mode is extremely shifted. ● Activate ADJUSTMENT OFFSET mode of 1st FACTRY ADJ mode.(telop:blue) ● Press the 3 key on the remote control unit to select CONTRAST. ● Press the ◀ or ▶ keys so that the telop shows about 0.
3	PIONEER 's standard settings	Brightness adjustment	Cross hatch	BRIGHT (remote control unit)	● Pless the 4 key on the remote control unit to select BRIGHT in ADJUSTMENT OFFSET mode of 1st FACTORY ADJ mode. ● Adjust the cut off level at TP-GK on the G.CRT DRIVE assembly to 190V DC. 
4	Deflection yoke lean adjustment		Cross signal (or generate a test cross signal for convergence adjustment by applying a free signal.)	Deflection yoke mounting position of replaced CRT assembly (left and right lean)	Note1: This adjustment should be done in NORMAL mode. Note2: This adjustment is required when a CRT assembly and deflection yoke were replaced. ● Loosen the fixing screw of the deflection yoke for the color to be replaced and turn the adjustment point right and left so that the lean parts of the vertical and horizontal lines at the center of the screen align with the lines of a color not replaced. ● After adjustment, tighten the fixing screw for the daflection yoke.
5	Screen center adjustment		Cross signal (or generate a test cross signal for convergence adjustment by applying a free signal.)	Centering magnet of the deflection yoke of replaced CPT assembly (see Fig.7-7)	Note1: This adjustment should be done in NORMAL mode. Note2: This adjustment is to adjust the center point of the screen when a CRT assembly and deflection yoke were replaced. For red or blue adjustment,turn 1st FACTORY ADJ mode ON and then OFF to place the convergence POSITION at the center of the adjustable range. ● Move the centering magnet of the deflection yoke for the replaced color so that the horizontal and vertical lines at the center of the screen align with the lines for a color not replaced.
6	Focus adjustment of Lens assembly		Cross hatch	Lens assembly mounted to replaced CRT assembly	To the adjust the lens assembly, remote the screen frame block, and attach a piece of translucent paper such as tracing paper with tape as shown in Fig.7-7. ● Move the lens assembly left and right as shown in Fig.7-7 until the best focusing is obtained.
7	Focus VR adjustment		Cross hatch	Focus VR (VR1)	● Turn the forcus VR for best focusing. ● Repeat adjustments for the lens assembly and focus VR. Note: For adjusting the focus for blue,the following adjustment is required after the focus adjustment mentioned above. Turn the focus VR for blue clockwise so that a blue line is slightly thickened compared with the line with the focus adjusted.

STEP NO.	Adjustment Item	Input Signal	Adjustment point	Adjustment Prdcedure
8	Vertical size adjustment	Monoscope or general broadcasting	VR181(S)	When a monoscope signal is used, adjust the size so that the following value is obtained. ● Horizontal Right : 94.5% ± 2%, Left : 93.5% ± 2% ● Vertical Upper : 90% ± 3%, Lower : 91% ± 3% When general broadcasting is used, adjust the size so that the picture is completely displayed on the screen.
9	Horizontal size adjustment		VR154(S)	
10	Convergence adjustment	Cross hatch	Adjustment using the remote control unit	● Adjust so that the green cross hatch display normally appears on the screen with only the green CRT drive activated. ● Adjust the red line so that it aligns with the green line on the cross hatch screen with the green and red CRT drives activated. ● Adjust the blue line so that it aligns with a green line on the cross hatch screen with the green and blue CRT drives activated. Note:For details on the convergence adjustment, see section "7.4 CONVERGENCE ADJUSTMENT"
11	White balance adjustment	Color bar signal without color signal	ScreenVR(VR1), VR251(T) (Blue drive VR) VR252(T) (Red drive VR)	● Adjust the screen VR (red or blue) so that the dark part of the screen becomes gray. Do not move the screen VR(green). ● Adjust the drive VRs(red or blue) so that the bright part of the screen becomes white.
12	Test cross H-center position adjustment	Free video signal	TC401(T)	● Set the test cross screen for adjusting the convergence position.(For user) ● Adjust the position so that the test cross is placed at the center of the screen.
13	Tuner block adjustment	The audio section in the tuner block is adjusted. For the items to be adjusted, see section "7.5 TUNER SECTION."		
● Set to the ADJUSTMENT OFFSET mode of 1st FACTORYADJ mode (Telop:Blue)				
14	PIONEER's standard settings Sharpness adjustment	Multiburst	SHARPNESS (Remote control unit)	● Adjust the ratio of A (the level from black to white) to B (peak-to-peak value of 2 MHz)at TP-13 on the TUNER-VIDEO ASSY to A : B = 8 : 4 . Adjustment screen to optimum condition. A : B = 8 : 4 

<table>
<tr><th>STEP NO.</th><th colspan="2">Adjustment Item</th><th>Input Signal</th><th>Adjustment point</th><th>Adjustment Prdcedure</th></tr>
<tr><td>15</td><td rowspan="4">PIONEER's standard settings</td><td>Color adjustment</td><td rowspan="3">Color bar</td><td>COLOR (Remote control unit)</td><td>Adjustment screen to optimum condition.</td></tr>
<tr><td>16</td><td>Tint adjustment</td><td>TINT (Remote control unit)</td><td>Adjustment screen to optimum condition.</td></tr>
<tr><td rowspan="2">17</td><td rowspan="2">Contrast adjustment</td><td>CONTRAST (Remote control unit)</td><td>Adjustment screen to optimum condition.</td></tr>
<tr><td>Normal video signal</td><td>—</td><td>At the TP-BK of B.CRT assy, check that the signal is shaped as shown below.

Shapely waveform Shapeless waveform</td></tr>
<tr><td rowspan="2">18</td><td colspan="2" rowspan="2">Picture quality setting for GAME</td><td colspan="3">● Set to the GAME setting mode of FACTORY ADJ mode(Telop:Yellow).</td></tr>
<tr><td>Normal color video signal (For setting the numeric value only,no signal is required.)</td><td colspan="2">Set the telop value as shown below,using a remote control unit.
<table><tr><th>Adjustment items</th><th>Telop</th></tr><tr><td>COLOR</td><td>15</td></tr><tr><td>TINT</td><td>0</td></tr><tr><td>CONTRAST</td><td>−75</td></tr><tr><td>BRIGHT</td><td>15</td></tr><tr><td>SHARPNESS</td><td>0</td></tr></table></td></tr>
<tr><td colspan="6">● Set the FACTORY ADJ mode to OFF and picture-in-picture function to ON.
● Supply the same signal to both the main and sub pictures.</td></tr>
<tr><td>19</td><td colspan="2">Y-signal level adjustment of sub-picture</td><td>100% white</td><td>VR3502(A)</td><td>Observe the waveform at pin 2 (Y-OUT) of connector A3 of the AV I/O ASSY and adjust the 100% white position of the sub-picture so that it aligns with that of the main-picture.
 </td></tr>
<tr><td>20</td><td colspan="2">TINT adjustment of sub-picture</td><td rowspan="2">Color bar</td><td>VR3501(A)</td><td>Adjust the TINT of the sub-picture to optimum condition.</td></tr>
<tr><td>21</td><td colspan="2">Color level adjustment of sub-picture</td><td>VR3503(A)</td><td>Adjust the color level of the sub-picture to optimum condition.</td></tr>
</table>

STEP NO.	Adjustment Item	Input Signal	Adjustment point	Adjustment Prdcedure
22	Write clock adjustment	Monoscope signal	F3501(A)	Adjust the position so that the center of monoscope signal is placed at the center of the sub-picture.  A = B Main-picture Sub-picture
23	Read clock adjustment		F3502(A)	● Shift (＊ 1) the position of sub-picture and measure the margins C at position 3 and D at position 2 from center of main-picture. ● Adjust the margins C and D so that the margins to equal.  sub-picture position 3 sub-picture position 2 C D sub-picture position 4 sub-picture position 1 Main picture Center of main picture

＊ 1: To shift the position of the sub picture, use the MENU screen and remote control unit as the following:

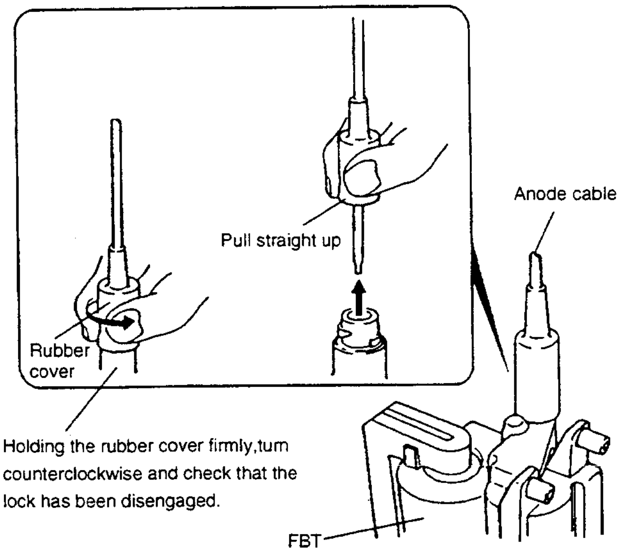
● Press MENU key → Set **PINP** by ◀ , ▶ keys → Press SET key
Shift the position by SET key ← Set **SHIFT** by ▲ , ▼ keys ←

7.3 ANODE VOLTAGE MEASURING METHOD

Disconnect the FBT anode cable as outlined in Fig. 7-5.
Measure at the point where the cable enters the FBT.

Caution: Take extra precaution when measuring this high voltage. High voltages are also present in surrounding circuit boards (CRT DRIVE assembly, POWER SUPPLY assembly).

SERVICEMAN WARNING
Before removing the anode cable,turn off the power, unplug the AC plug and let the unit discharge for more than 1 minute.


Anode cable
Pull straight up
Rubber cover
FBT

Holding the rubber cover firmly,turn counterclockwise and check that the lock has been disengaged.

Note:When reconnecting the cable,proceed in the reverse order.
After reconnecting,tug on the cable to check that it is secure.

Fig.7-5 Disconnecting the anode cable

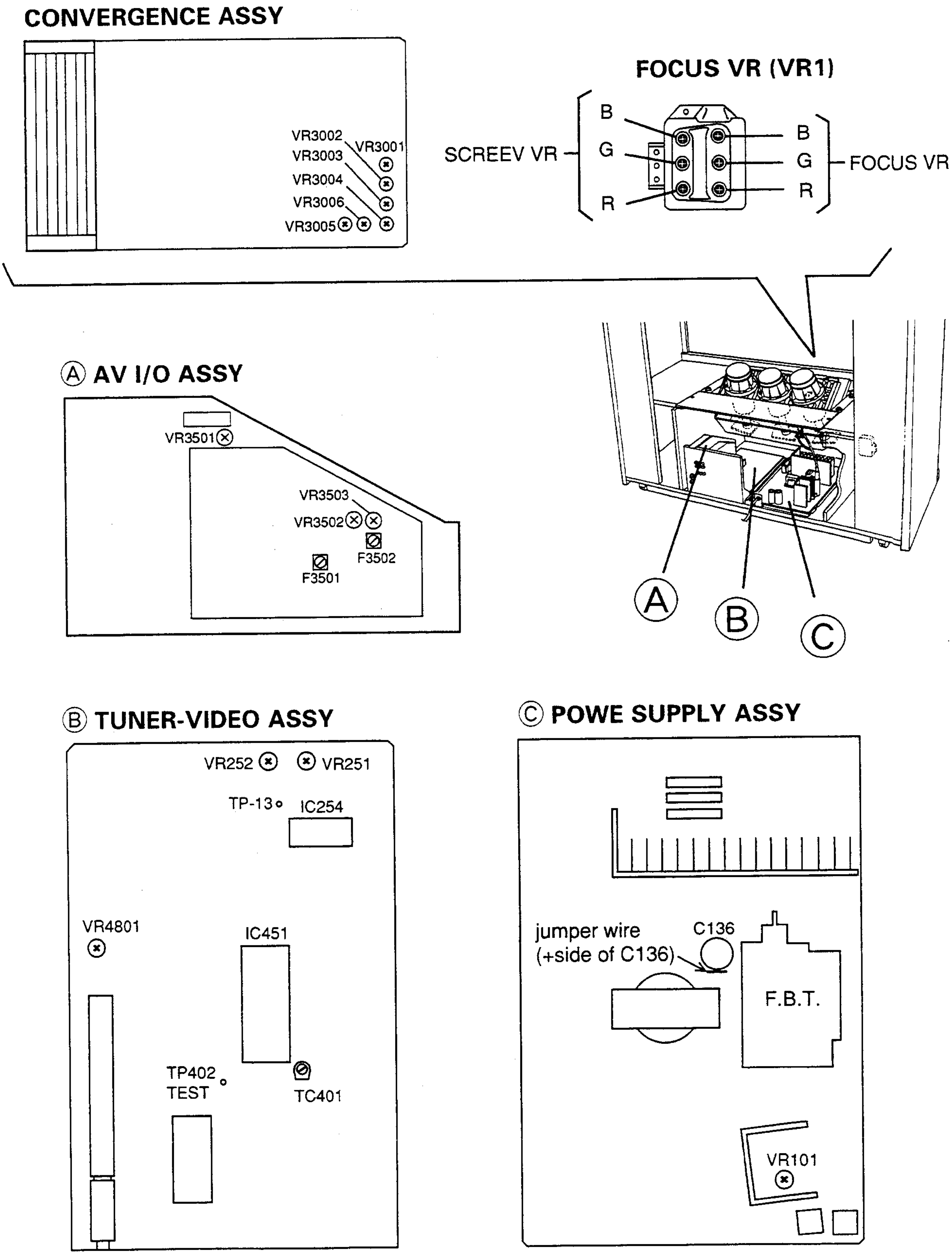
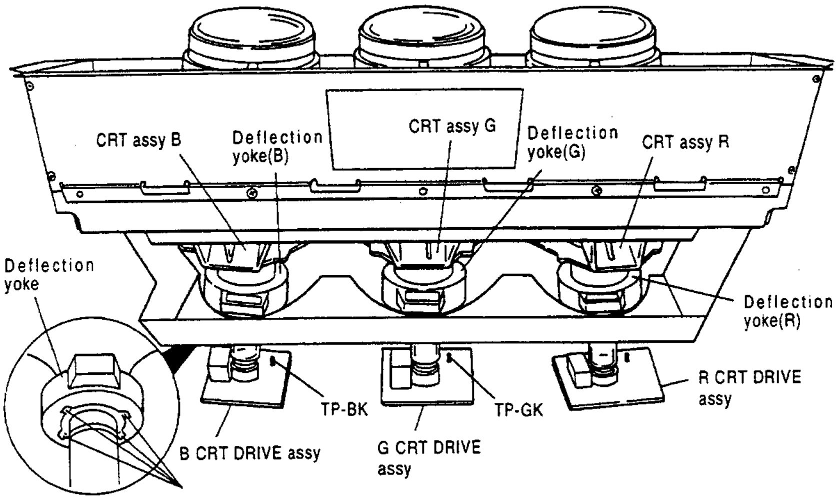

CONVERGENCE ASSY
VR3002
VR3001
VR3003
VR3004
VR3006
VR3005
FOCUS VR (VR1)
SCREEV VR
B
G
R
B
G
R
FOCUS VR
Ⓐ AV I/O ASSY
VR3501
VR3503
VR3502
F3502
F3501
Ⓐ
Ⓑ
Ⓒ
Ⓑ TUNER-VIDEO ASSY
VR252
VR251
TP-13
IC254
VR4801
IC451
TP402
TEST
TC401
Ⓒ POWE SUPPLY ASSY
jumper wire
(+side of C136)
C136
F.B.T.
VR101

Fig.7-6 Adjustment point(1)


CRT assy B
Deflection yoke(B)
CRT assy G
Deflection yoke(G)
CRT assy R
Deflection yoke
Deflection yoke(R)
R CRT DRIVE assy
TP-BK
TP-GK
B CRT DRIVE assy
G CRT DRIVE assy
Centering magnet

(Turn in either direction untill cross signal becomes white.)

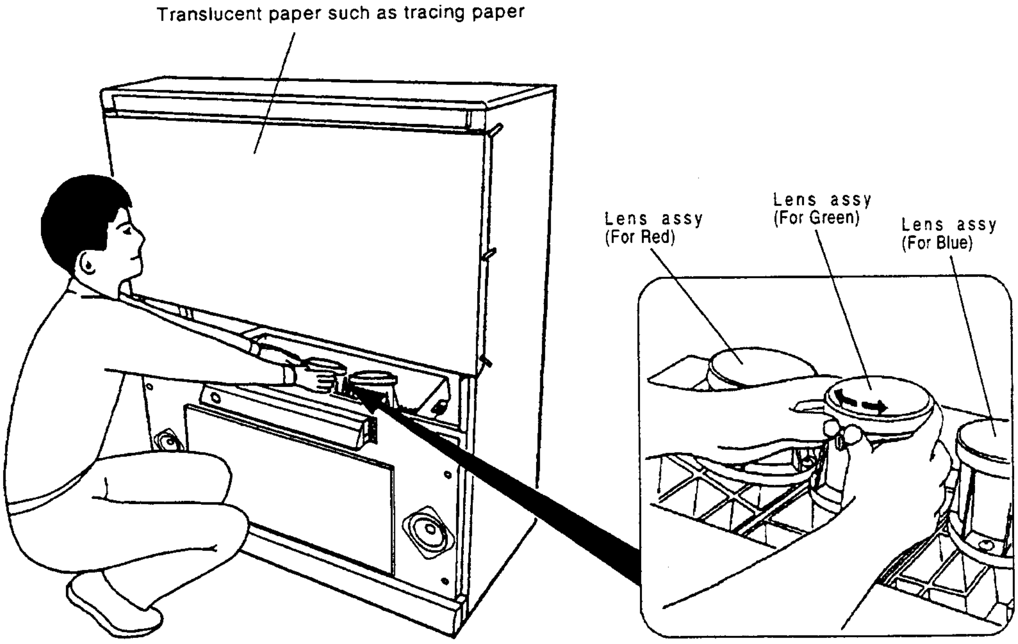

Translucent paper such as tracing paper
Lens assy (For Red)
Lens assy (For Green)
Lens assy (For Blue)

Fig.7-7 Adustment point(2)

7.4 CONVERGENCE ADJUSTMENT

7.4.1 Adjustment Method for Convergence

Perform the adjustment in ADJ. CONVERGE of FACTORY ADJ mode.(For how to enter the FACTORY ADJ mode,see section "FACTORY ADJ mode" on page 81.)

● **Green line convergence adjustment**

Adjust the green line convergence with VRs on the CONVERGENCE ASSY.

● **Red or blue line convergence adjustment**

Perform the following adjustment using the remote control unit.

- Operating procedure

Alphabetics shown in the lower-left portion of the screen indicate the type of convergence. Change the type by pressing the CH RETURN (or ANT) key on the remote control unit. Every time the CH RETURN (or ANT) key is pressed,the type changes in the order.

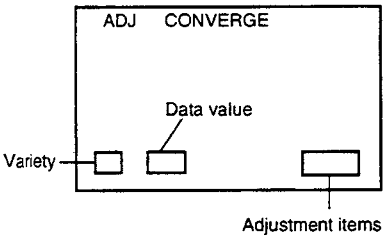
→ RH → RV → BH → BV ┐ cyclically

The characters to the right of the type indicate the setting value,and can be changed with the VOL (⊞,⊟) keys on the remote control unit. It the lower-right portion of the screen,the adustment items are displayed. The items are assigned to the numeric keys from 0: STATIC to 9 : SUB LIN, on the remote control unit.

● **To output red,green and blue separately**

- To output red : Press the DISPLAY key on the remote control unit,then TV key.
- To output green:Press the DISPLAY key on the remote control unit,then LD key.
- To output Blue:Press the DISPLAY key on the remote control unit,then VIDEO1 key.

To change the displayed color, be sure to press DISPLAY key. If the next key is pressed without pressing the DISPLAY key,colors are overlaid.



- Variety

→ RH (Red · Horizontal)
↓
RV (Red · Vertical)
↓
BH (Blue · Horizontal)
↓
BV (Blue · Vertical) ┘

- Data value

Adjust the value by pressing the VOL(⊞,⊟) keys on the remote control unit.

- Adjustment items

(assigned to the numeric keys)

0 : STATIC
1 : SKEW
2 : BOW → 4TH BOW ┐
3 : SUB KEY
4 : KEY → MID KEY ┐
5 : SUB PIN → M S PIN → 4 S PIN → S C PIN ┐
6 : PIN → MID PIN → 4TH PIN ┐
7 : LIN → 4TH LIN ┐
8 : SIZE
9 : SUB LIN

Fig.7-8 Adjustment method for convergence

Numeric keys	Adjustment items	Type					
		GH	GV	RH	RV	BH	BV
0	STATIC	/	/	○	○	○	○
1	SKEW	/	VR	○	○	○	○
2	BOW ←	/	VR	○	○	○	○
	↓ 4TH BOW	/	/	○	/	○	/
3	SUB KEY	/	/	○	○	○	○
4	KEY ←	VR	VR	○	○	○	○
	↓ MID KEY	/	/	/	○	/	○
5	SUB PIN ←	/	/	○	○	○	○
	↓ M S PIN	/	/	○	/	○	/
	↓ 4 S PIN	/	/	○	/	○	/
	↓ S C PIN	/	/	/	○	/	○

Numeric keys	Adjustment items	Type					
		GH	GV	RH	RV	BH	BV
6	PIN ←	VR	VR	○	○	○	○
	↓ MID PIN	/	/	○	○	○	○
	↓ 4TH PIN	/	/	○	○	○	○
7	LIN ←	/	/	○	○	○	○
	↓ 4TH LIN	/	/	○	/	○	/
8	SIZE	/	/	○	○	○	○
9	SUB LIN	/	/	○	○	○	○

○ = yes,/ = No, VR = Adjust GH, GV with a semifixed VR.

7.4.2 Green Line Adjustment

- A green line is a reference line for the red and blue lines. Be sure to adjust precisely.
- Perform the green line adjustment with a single green color.
- For information on blocks which are referred to in some operation columns,see Fig.7-9 and 7-13.

Step No.	Adjustment item		Adjustment point	Adjustment Procedure
1	Center line adjustment	GV-SKEW	VR3001(C)	Ajust so that the center horizontal line of the screen is not leaned.
2		GV-BOW	VR3002(C)	Ajust so that the center horizontal line of the screen is straight.
3	Repeat steps 1 and 2 to obtain the optimum center horizontal lines.			
4	Distortion adjustment	GV-PIN	VR3004(C)	Ajust so that the horizontal lines in the E block of the screen are straight.
5		GH-PIN	VR3006(C)	Ajust so that the vertical lines in the B and C blocks on the screen are straight.
6	Lean adjustment	GV-KEY	VR3001(C)	Ajust so that the horizontal lines in the E block of the screen are not leaned.
7		GH-KEY	VR3005(C)	Ajust so that the vertical lines in the B and C blocks on the screen are not leaned.
8	Repeat steps 4 through 7 and then 1 through 7 to obtain the optimum lines.			

7.4.3 Red line Adjustment

- Adjust the red line convergence using a green line and red line.
- Adjust it by overlaying a red line on a green line using the VOL (⊞ , ⊟) keys on the remote control unit so that the line becomes yellow.
- For information on blocks which are referred to in some operation columns,see Fig.7-9 and 7-13.

● Red Adjustment In the Horizontal Direction

Step No.	Adjustment item		Adjustment Procedure
1	Center line adjustment	RH-SKEW	Ajust so that the center vertical line of the screen is not leaned.
2		RH-BOW	Adjust so that the center vertical line of screen is not distorted and is straight.
3		RH-4TH BOW	
4		RH-STATIC	Converge the center vertical line in the green vertical line.
5	Repeat steps 1 through 4 to obtain the oputimum center vertical line.		
6	Lean adjustment	RH-SUB KEY	Adjust so that the vertical lines in the B and C blocks of the screen.
7		RH-KEY	
8	Repeat steps 6 and 7 to obtain vertical lines that are most perfectly vertical in the B and C blocks of the screen.		
9	Distortion adjustment	RH-M S PIN	Adjust so that the vertical lines in the right and left sections of the screen are not distorted and are stright.
10		RH-SUB PIN	
11		RH-4 S PIN	
12		RH-MID PIN	
13		RH-PIN	
14		RH-4TH PIN	
15	Repeat steps 9 throught 14 to obtain straight vertical lines in the right and left sections of the screen.		
16	Repeat steps 6 throught 15 to obtain the optimum vertical lines in the right and left sections of the screen.		
17	Line intervals adjustment	RH-4TH LIN	Adjust the intervals of the vertical lines in the right and left sections of the screen and converge then in the green vertical lines.
18		RH-LIN	
19		RH-SIZE	
20		RH-SUB LIN	
21	Repeat steps 17 through 20 to obtain the optimum vertical lines in the right and left sections of the screen.		
22	Fine-adjust over the entire picture to obtain the optimum picture.		

● Red Adjustment In the Vertical Direction

Step No.	Adjustment item		Adjustment Procedure
1	Center line adjustment	RV-SKEW	Adjust so that the center horizontal line of the screen is not leaned.
2		RV-BOW	Adjust so that the center horizontal line of the screen is not distorted and is straight.
3		RV-STATIC	Converge the center horizontal line in the green horizontal line.
4	Repeat steps1 through 3 to obtain the optimum center horizontal line.		
5	Lean adjustment	RV-MID KEY	Adjust so that the horizontal lines in the D and E blocks of the screen are not leaned.
6		RV-SUB KEY	
7		RV-KEY	
8	Repeat steps 5 and 7 to obtain the horizontal lines that are most perfectly horizontal in the D and E blocks of the screen.		
9	Distortion adjustment	RV-SUB PIN	Adjust so that the horizontal lines in the upper and lower sections of the screen are not distorted and are straight.
10		RV-MID PIN	
11		RV-PIN	
12		RV-S C PIN	
13		RV-4TH PIN	
14	Repeat steps 9 throught 13 to obtain straight horizontal lines in the upper and lower sections of the screen.		
15	Repeat steps 5 throught 14 to obtain the optimum horizontal lines in the upper and lower sections of the screen.		
16	Line intervals adjustment	RV-LIN	Adjust the intervals of the horizontal lines in the D and E blocks of the screen and converge them in the green horizontal lines.
17		RV-SIZE	
18		RV-SUB LIN	
19	Repeat steps 16 through 18 to obtain the optimum horizontal lines in the upper and lower sections of the screen.		
20	Fine-adjust over the entire picture to obtain the optimum picture.		

7.4.4 Blue line Adjustment

- Adjust the blue line convergence using a green line and blue line.
- Adjust it by overlaying a blue line on a green line using the VOL (⊞ , ⊟) keys on the remote control unit so that the line becomes cyan.
- For information on blocks which are referred to in some operation columns,see Fig.7-9 and 7-13.

● Blue Adjustment In the Horizontal Direction

Step No.	Adjustment item		Adjustment Procedure
1	Center line adjustment	BH-SKEW	Ajust so that the center vertical line of the screen is not leaned.
2		BH-BOW	Adjust so that the center vertical line of screen is not distorted and is straight.
3		BH-4TH BOW	
4		BH-STATIC	Converge the center vertical line in the green vertical line.
5	Repeat steps 1 through 4 to obtain the oputimum center vertical line.		
6	Lean adjustment	BH-SUB KEY	Adjust so that the vertical lines in the B and C blocks of the screen are not leaned.
7		BH-KEY	
8	Repeat steps 6 and 7 to obtain vertical lines that are most perfectly vertical in the B and C blocks of the screen.		
9	Distortion adjustment	BH-M S PIN	Adjust so that the vertical lines in the right and left sections of the screen are not distorted and are stright.
10		BH-SUB PIN	
11		BH-4 S PIN	
12		BH-MID PIN	
13		BH-PIN	
14		BH-4TH PIN	
15	Repeat steps 9 throught 14 to obtain straight vertical lines in the right and left sections of the screen.		
16	Repeat steps 6 throught 15 to obtain the optimum vertical lines in the right and left sections of the screen.		
17	Line intervals adjustment	BH-4TH LIN	Adjust the intervals of the vertical lines in the right and left sections of the screen and converge them in the green vertical lines.
18		BH-LIN	
19		BH-SIZE	
20		BH-SUB LIN	
21	Repeat steps 17 through 20 to obtain the optimum vertical lines in the right and left sections of the screen.		
22	Fine-adjust over the entire picture to obtain the optimum picture.		

● Blue Adjustment In the Vertical Direction

Step No.	Adjustment item		Adjustment Procedure
1	Center line adjustment	BV-SKEW	Adjust so that the center horizontal line of the screen is not leaned.
2		BV-BOW	Adjust so that the center horizontal line of the screen is not distorted and is straight.
3		BV-STATIC	Converge the center horizontal line in the green horizontal line.
4	Repeat steps1 through 3 to obtain the optimum center horizontal line.		
5	Lean adjustment	BV-MID KEY	Adjust so that the horizontal lines in the D and E blocks of the screen are not leaned.
6		BV-SUB KEY	
7		BV-KEY	
8	Repeat steps 5 and 7 to obtain the horizontal lines that are most perfectly horizontal in the D and E blocks of the screen.		
9	Distortion adjustment	BV-SUB PIN	Adjust so that the horizontal lines in the upper and lower sections of the screen are not distorted and are straight.
10		BV-MID PIN	
11		BV-PIN	
12		BV-S C PIN	
13		BV-4TH PIN	
14	Repeat steps 9 throught 13 to obtain straight horizontal lines in the upper and lower sections of the screen.		
15	Repeat steps 5 throught 14 to obtain the optimum horizontal lines in the upper and lower sections of the screen.		
16	Line intervals adjustment	BV-LIN	Adjust the intervals of the horizontal lines in the D and E blocks of the screen and converge them in the green horizontal lines.
17		BV-SIZE	
18		BV-SUB LIN	
19	Repeat steps 16 through 18 to obtain the optimum horizontal lines in the upper and lower sections of the screen.		
20	Fine-adjust over the entire picture to obtain the optimum picture.		

7.4.5 Picture Movements in Horizontal Adjustments

The adjustments in the horizontal direction are performed by applying the convergence correction signals to the horizontal deflection and changing the amount of the correction. With these adjustments, the vertical lines will move.

This section describes the picture movements and the adjusting points when adjusting each item using a cross hatch signal input.

See Fig. 7-9 for reference, in which each of the sections to the right and left to the center vertical line of the screen are divided into three blocks to describe the picture movements.

- Center–line adjustment in the Horizontal Direction

See Table 7-1 for the picture movements and general information on this adjustment.

This adjustment consists of H-SKEW, H-BOW, H-4TH BOW and H-STATIC to correct the overall picture. Adjust the center vertical line so that it is not distorted and is straight and perfectly vertical.

The center vertical line does not move when adjusting the other items. Use the center vertical line set through this adjustment as reference for the other adjustments. After adjusting the center line, adjust the screen sections to the right and left of the center line.

Note that there may be some deviation in the overall picture if this adjustment is performed alone. Finely adjust the picture with subsequent adjustments.

Caution

Be sure to adjust H-STATIC by changing the data value within the range (010 to -010) of the telop indication in CONVER ADJ mode of FACTORY ADJ mode. If this range is exceeded, the convergence assembly may be damaged. If the adjustment is not possible within the range of 010 to -010, set the data value to 0, turn the centering magnet of the deflection yoke and fine-adjust H-STATIC.

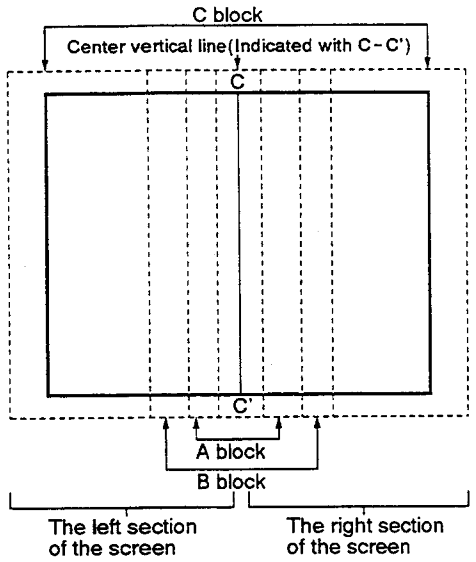
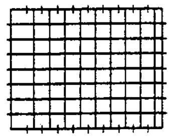
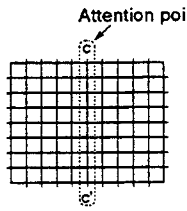
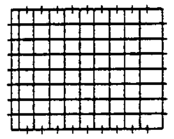
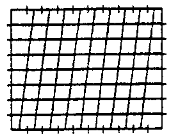
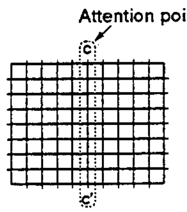
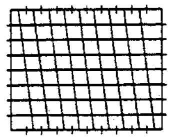
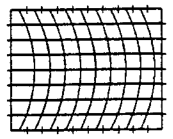
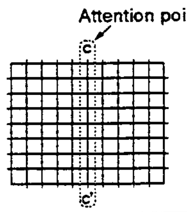
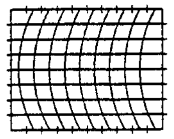
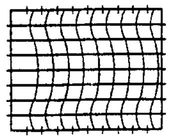
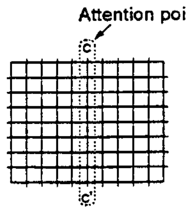
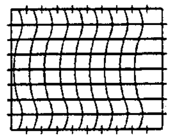

C block
Center vertical line(Indicated with C-C')
C
C'
A block
B block
The left section of the screen
The right section of the screen

Fig. 7-9 Screen Divisions for Horizontal Adjustment

Table 7-1 Center-line Adjustment in the Horizontal Direction

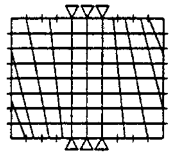
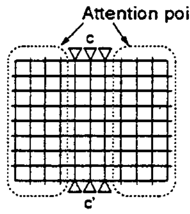
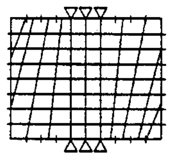
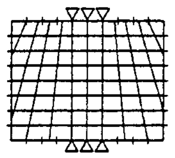
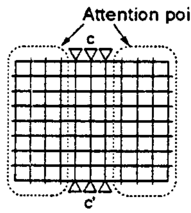
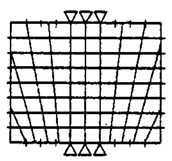
Item	Deviating Picture	Corrected Picture	Deviating Picture	Attention Point on the Screen During Adjustment	Adjustment Point		Remarks
H-STATIC *1				Center vertical line	Move the vertical line at the attention point on the screen shown in the figure to the left to converge it in the green line which has been set for reference. This provides the reference position of the center vertical line for the convergence adjustment.		The overall picture moves in parallel in the same manner as with the user-convergence adjustment.
H-SKEW				Center vertical line	Eliminate the lean at the attention point on the screen shown in the figure to the left.	Adjust H-SKEW, H-BOW, H-4TH BOW repeatedly until the center vertical line is straight and is perfectly vertical. Adjust H-SKEW and H-4TH BOW so that the A blocks are in the optimal condition. (The lean and waving distortion in the A blocks cannot be eliminated with the other adjustments.)	The lean of the overall picture is corrected. As shown in the figure to the left, the overall picture is leaned.
H-BOW				Center vertical line	Adjust so that the bowed line at the attention point on the screen shown in the figure to the left is straight.		The bowed lines over the overall screen are corrected. All the vertical lines are bowed as shown in the figure to the left.
H-4TH BOW				Center vertical line	Adjust so that the wavy line in the attention-point on the screen shown in the figure to the left is straight.		The waving (fourth-order) distortion over the overall screen is corrected. As shown in the figure to the left, the whole picture is distorted in waves.

*1 : H-STATIC can be shifted for convenience while adjusting the other items. Be sure to adjust the other items in consideration of the shift in H-STATIC and then readjust H-STATIC. (Be sure to shift it within the telop indication range of 010 to -010.)

- Lean Adjustment in the Horizontal Direction

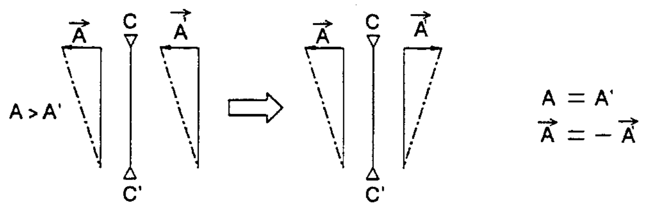
See Table 7-2 for the picture movements and general information on this adjustment.
The right and left sections of the screen are corrected with H-SUB KEY and H-KEY. Adjust the lean in the B and C blocks on the screen to eliminate.

Table 7-2 Lean adjustment in the Horizontal direction

Item	Deviating Picture	Corrected Picture Screen	Deviating Picture	Attention Point on the Screen During Adjustment	Adjustment Point		Remarks
H-SUB KEY *1				B and C blocks	Adjust to eliminate any lean at the attention-point blocks on the screen shown in the figure to the left. If the lean cannot be eliminated, set the screen to the status in which H-KEY has deviation as shown in Fig. 7-10, and adjust H-KEY.	Alternately adjust H-SUB KEY and H-KEY so that the lean in the B and C blocks is eliminated.	The lean in the B and C blocks on the screen is corrected. The right and left sections of the screen move in the same direction.
H-KEY				B and C blocks	Adjust to eliminate the lean in the attention-point blocks on the screen shown in the figure to the left.		The lean in the the B and C blocks on the screen is corrected. The right and left sections move symmetrically in relation to the center line.

*1 : H-SUB-KEY substantially differs from that of the previous-year model SD-P4053-K in picture movement and attention points.

Note:
▷————◁ : Line which does not move.



$\vec{A} = -\vec{A}$

Note:
C ▷————◁ C' : Center vertical line
———— : Reference line
-·-·-·- : Leaned line

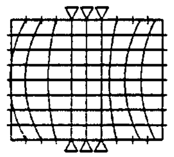
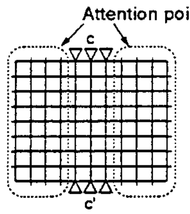
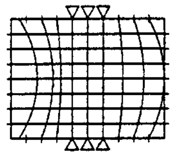
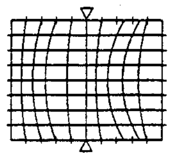
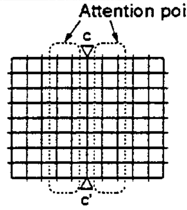
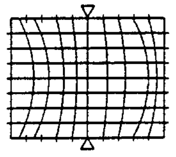
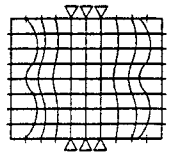
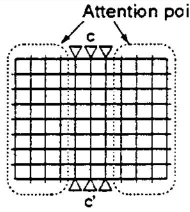
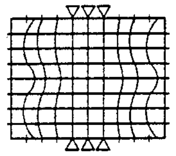
$\vec{A}$: Vector of the deviation in the left section of the screen
$\vec{A}$: Vector of the deviation in the right section of the screen
A : Scalar quantity of the deviation in the left section of the screen
A' : Scalar quantity of the deviation in the right section of the screen

Fig. 7-10 Example of H-SUB KEY

- Distortion Adjustment in the Horizontal Direction (1)

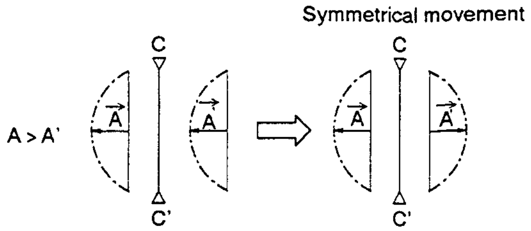
See Table 7-3 for the picture movements and general information on this adjustment.
In this adjustment, the distortion on the screen is corrected with H - M S PIN, H - SUB PIN and H - 4 S PIN while moving the right and left sections in the same direction.
Adjust them so that the distortion in the right and left sections is eliminated and the vertical lines in both sections are straight. If straight lines cannot be obtained, first set the picture to the status in which it is symmetrically distorted and then adjust H - MID PIN, H - PIN and H - 4TH PIN.

Table 7-3 Distortion Adjustment in the Horizontal Direction (1)

Item	Deviating Picture	Corrected Picture	Deviating Picture	Attention Point on the Screen During Adjustment	Adjustment Point		Remarks
H-SUB PIN *1	 ⇔	 ⇔		B and C blocks (Especially C block)	Adjust so that any bowed lines in the attention-point blocks on the screen shown in the figure to the left are straight.	First adjust the A block with H - M S PIN and set the B block to a roughly-adjusted state. Then adjust the B and C blocks with H - SUB PIN. If the B and C blocks are distorted in waves, adjust H - 4 S PIN. Repeat these adjustments until the vertical lines in both the left and right sections of the screen are straight. If straight lines cannot be obtained, move the right and left sections symmetrically as shown in Fig. 7-11 in the opposite directions to the same extent and adjust H - MID PIN, H - PIN and H - 4TH PIN.	The bowed lines are corrected centering the C block on the screen. As shown in the figure to the left, the lines in the C block move more than those in the B block. The lines in the right and left sections move in the same direction.
H-M S PIN *1	 ⇔	 ⇔		A and B blocks (Especially B block)	Adjust so that any bowed lines in the attention-point blocks on the screen shown in the figure to the left are straight.		The bowed lines are corrected centering the B block on the screen. As shown in the figure to the left, the B block move more than the C block. The right and left sections move in the same direction.
H-4 S PIN	 ⇔	 ⇔		B and C blocks	Adjust so that any wavy lines in the attention-point blocks on the screen shown in the figure to the left are straight.		The wavy lines (fourth-order) are corrected in the B and C blocks on the screen. The right and left sections move in the same direction.

*1 : H - SUB PIN and H - M S PIN work relative to each other. Be sure to adjust them alternately.

Note:
▷———◁ : Line which does not move.



Note:
C ▷———◁ C' : Center vertical line
——— : Reference line
-·-·-·-·- : Distorted line

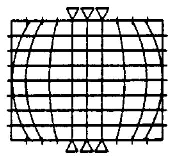
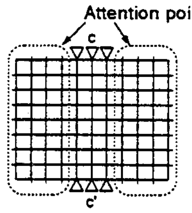
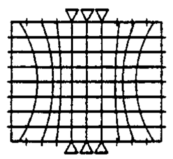
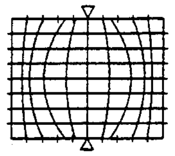
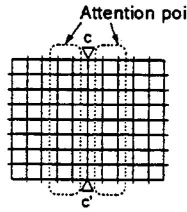
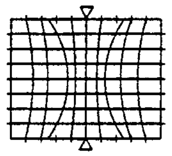
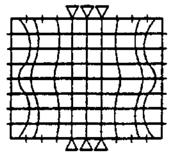
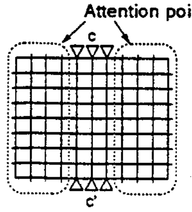
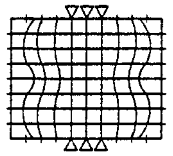
$\vec{A}$: Vector of the deviation in the left section of the screen
$\vec{A'}$: Vector of the deviation in the right section of the screen
A : Scalar quantity of the deviation in the left section of the screen
A' : Scalar quantity of the deviation in the right section of the screen

Fig. 7-11 Example of Distortion Adjustment in the Horizontal Direction (1)

- Distortion Adjustment in the Horizontal Direction (2)

See Table 7-4 for the picture movements and general information on this adjustment.
In this adjustment, the distortion on the screen is corrected with H - MID PIN, H - PIN and H - 4TH PIN while moving the right and left sections of the screen symmetrically in relation to the center line. Adjust so that the distortion in the right and left sections is eliminated and the vertical lines in both sections are straight.

Table 7-4 Distortion Adjustment in the Horizontal Direction (2)

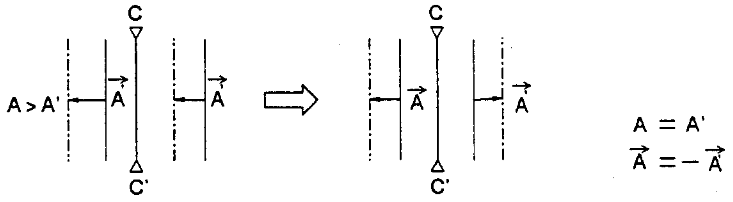
Item	Deviating Picture	Corrected Picture	Deviating Picture	Attention Point on the Screen During Adjustment	Adjustment Point		Remarks
H-PIN *1	 ⇔		⇔ 	B and C blocks (Especially C block)	Adjust so that any bowed lines in the attention-point blocks on the screen shown in the figure to the left are straight.	First adjust the A blocks with H - MID PIN and set the B blocks to a roughly-adjusted state. Then adjust the B and C blocks with H - PIN. If there is waving distortion, adjust H - 4TH PIN. Repeat these adjustments until the vertical lines in both the left and right sections of the screen are straight.	The bowed lines are corrected centering the C block on the screen. As shown in the figure to the left, the C block move more than the B block. And the right and left sections move symmetrically in relation to the center line.
H-MID PIN *1	 ⇔		⇔ 	A and B blocks (Especially B block)	Adjust so that any bowed lines in the attention-point blocks on the screen shown in the figure to the left are straight.		The bowed lines are corrected centering the B block on the screen. As shown in the figure to the left, the B block move more than the C block. And the right and left sections move symmetrically in relation to the center line.
H-4TH PIN	 ⇔		⇔ 	B and C blocks	Adjust so that any wavy lines in the attention-point blocks on the screen shown in the figure to the left are straight.		The wavy lines (fourth-order) are corrected in the B and C blocks on the screen. As shown in the figure to the left, and the right and left sections move symmetrically in relation to the center line.

*1 : H-PIN and H-MID PIN work relative to each other. Be sure to adjust them alternately.

Note:
▷———◁ : Line which does not move.

- Line - Interval Adjustment in the Horizontal Direction

See Table 7-5 for the picture movements and general information on this adjustment.
In this adjustment, the intervals of the vertical lines are corrected with H - 4TH LIN, H - LIN, H - SIZE and H - SUB LIN. Converge the vertical lines in the right and left sections of the screen in the green vertical lines which have been set for reference.
The differences between H - LIN, H - 4TH LIN, H - SIZE and H - SUB LIN are shown in Table 7-6.



Note:
C▷————◁C' :Center vertical line
———— :Reference line
-·-·-·-·- :Deviating line

$\vec{A}$:Vector of the deviation in the left section of the screen
$\vec{A'}$:Vector of the deviation in the right section of the screen
A :Scalar quantity of the deviation in the left section of the screen
A' :Scalar quantity of the deviation in the right section of the screen

Fig. 7-12 Example of Line-Interval Adjustment in the Horizontal Direction

Table. 7-6 Difference Between Adjustment Items

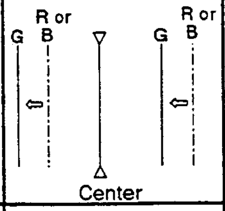
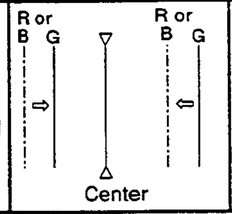
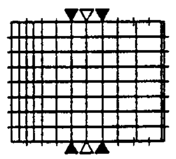
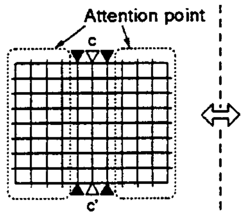
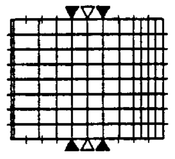
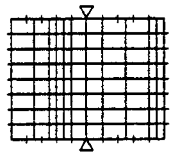
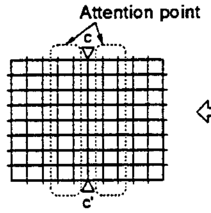
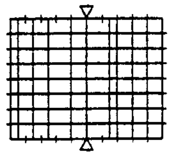
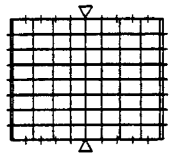
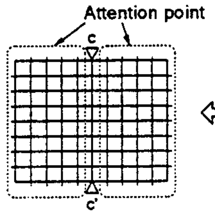
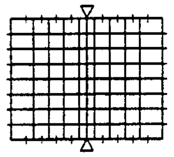
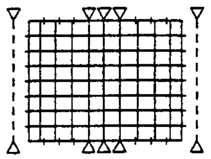
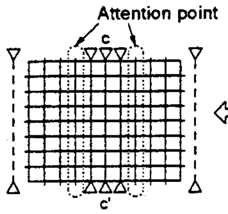
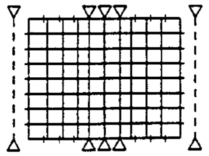
Item	Screen Example	Remarks
H-4TH LIN and H-LIN		H-4 TH LIN and H-LIN should be adjusted when the right and left sections of the screen show deviation in the same direction.
H-SIZE and H-SUB LIN		H-SIZE and H-SUB LIN should be adjusted when the right and left sections of the screen show deviation symmetrically in relation to the center line.

Table 7-5 Line-Interval Adjustment in the Horizontal Direction

Item	Deviating Picture	Corrected Picture	Deviating Picture	Attention Point on the Screen During Adjustment	Adjustment Point		Remarks
H-LIN *1				B and C blocks	Observe the movements with H-SIZE and H-SUB LIN and move the lines in the right and left sections in the opposite directions to the same extent. (See Fig. 7-12.)	First move the lines in the A blocks with H-4TH LIN and then those in the B and C blocks with H-LIN. Adjust them repeatedly until the optimum line intervals are obtained. *2	The line intervals are corrected centering the C block on the screen. As shown in the figure to the left, the lines in the right and left sections of the screen move centering the respective C block.
H-4 TH LIN *1				A and B blocks (Especially B block)	Observe the movements with H-SIZE and H-SUB LIN and move the lines in the right and left sections in the opposite directions to the same extent. (See Fig. 7-12.)		The line intervals are corrected centering the A and B blocks on the screen. As shown in the figure to the left, the lines in the right and left sections of the screen move centering the respective A and B block.
H-SIZE *2				A, B and C blocks	Converge the vertical lines in the green vertical lines which have been set for reference.	Adjust the vertical lines in the right and left sections of the screen with H-SIZE. If the lines cannot be converged in the B blocks, adjust H-SUB LIN.	The line intervals in the right and left sections (A, B and C blocks) of the screen are corrected. As shown in the figure to the left, the line intervals in the right and left sections of the screen change with the center line as the axis.
H-SUB LIN *2				B block	Converge the vertical lines in the attention-point blocks on the screen shown in the figure to the left in the green vertical lines which have been set for reference.		The line intervals in the B block on the screen are corrected. As shown in the figure to the left, the lines in the center of B block of the right and left sections move in the same manner as with H-SIZE.

*1: H-4TH LIN and H-LIN work relative to each other. Be sure to adjust them alternately.
*2: When convergence in the green lines is achieved with H-4TH LIN and H-LIN, further adjustments with H-SIZE and H-SUB LIN are not necessary.

Note:
▷————◁ : Line which does not move at all.
▶————◀ : Line which hardly moves.
▷- - - - - - -◁ : Line which does not move out of the screen.

7.4.6 Picture Movements in Vertical Adjustments

The adjustments in the vertical direction are performed by applying the convergence correction signals to the vertical deviation to change the amount of correction. With these adjustments, the horizontal lines will move.
This section describes the picture movements and the adjusting points when adjusting each item using a cross hatch input.
See Fig. 7-13 for reference, in which each of the sections above and below the center horizontal line of the screen are divided into two blocks to describe the picture movements.

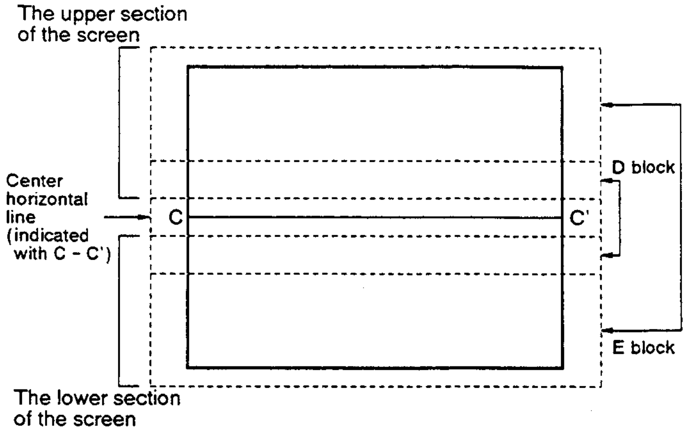

The upper section of the screen
Center horizontal line (indicated with C - C')
C
C'
D block
E block
The lower section of the screen

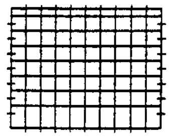
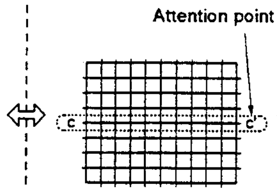
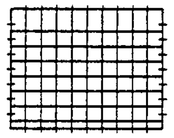
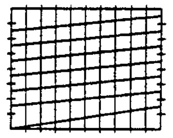
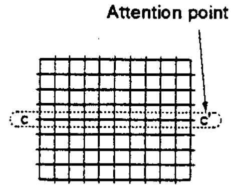
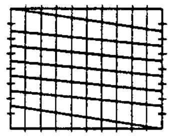
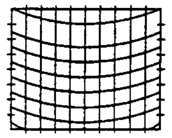
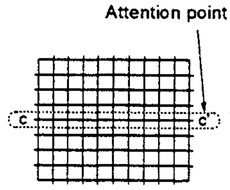
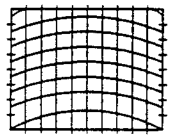
Fig. 7-13 Screen Divisions for Vertical Adjustments

- Center - line Adjustment in the Vertical Direction

See Table 7-7 for the picture movements and general information on this adjustment.
This adjustment consists of V - SKEW, V - BOW and V - STATIC to correct the overall picture. Adjust the center horizontal line so that it is not distorted and is straight and perfectly horizontal. The center horizontal line does not move when adjusting the other items. Use the center horizontal line set through this adjustment as the reference for the other adjustments. After adjusting the center line, adjust the screen sections above and below the center line.
Note that there may be some deviation in the overall picture if this adjustment is performed alone. Finely adjust the picture with subsequent adjustments.

Caution
Be sure to adjust V - STATIC by changing the data value within the range (010 to - 010) of the telop indication in CONVER ADJ mode of FACTORY ADJ mode.
If this range is exceeded, the convergence assembly may be damaged. If the adjustment is not possible within the range of 010 to - 010, set the data value to 0, turn the centering magnet of the deflection yoke and fine - adjust V - STATIC.

Table 7-7 Center - line Adjustment in the Vertical Direction

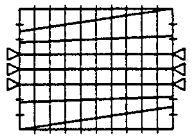
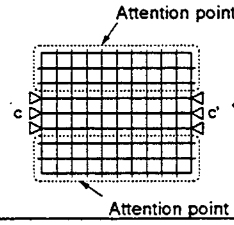
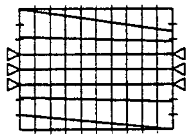
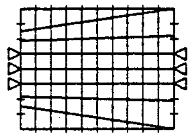
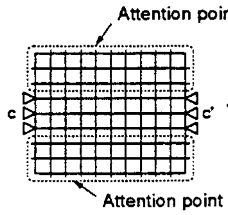
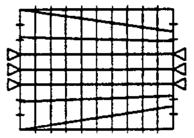
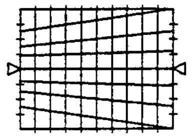
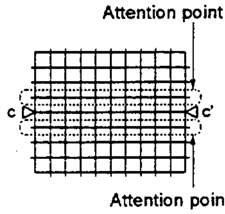
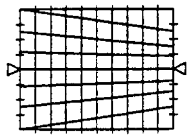
Item	Deviating Picture	Corrected Picture	Deviating Picture	Attention Point on the Screen During Adjustment	Adjustment Point		Remarks
V - STATIC *1				Center horizontal line	Move the horizontal line at the attention point on the screen shown in the figure to the left to converge it in the green line which has been set for the reference. This provides the reference position of the center horizontal line for the convergence adjustment.		The overall picture moves in parallel in the same manner as with the user - convergence adjustment.
V - SKEW				Center horizontal line	Eliminate the lean at the attention point on the screen shown in the figure to the left.	Adjust V-SKEW and V-BOW repeatedly until the center horizontal line is straight and is perfectly horizontal. Be sure to set to the range in which the D blocks can be adjusted with V - MID KEY. (For the D blocks, the distortion cannot be independently adjusted and the lean is eliminated only with V - MID KEY.)	The lean of the overall picture is corrected. As shown in the figure to the left, the overall picture is leaned.
V - BOW				Center horizontal line	Adjust so that the bowed line at the attention point on the screen shown in the figure to the left is straight.		The bowed lines over the screen are corrected. All the horizontal lines are bowed as shown in the figure to the left.

*1:V - STATIC can be shifted for convenience while adjusting the other items. Be sure to adjust the other items in consideration of the shift in V - STATIC and then readjust V - STATIC. (Be sure to shift it within the telop indication range of 010 to - 010.)

- Lean Adjustment in the Vertical Direction

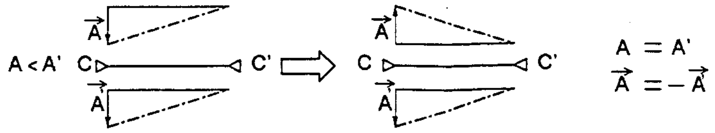
See Table 7-8 for the picture movements and general information on this adjustment.
In this adjustment, lean of the picture is corrected. Adjust V - SUB KEY, V - MID KEY and V - KEY to eliminating any lean in the upper and lower sections of the screen.

Table 7-8 Lean Adjustment in the Vertical Direction

Item	Deviating Picture	Corrected Picture	Deviating Picture	Attention Point on the Screen During Adjustment	Adjustment Point		Remarks
V - SUB KEY * 2				E block	Adjust to eliminate the lean in the attention-point blocks on the screen shown in the figure to the left. If the lean cannot be eliminated, set the screen to the status in which V - KEY has deviation as shown in Fig. 7-14, and adjust V - KEY.	First adjust V - MID KEY so that the lean in the D block is eliminated. Then adjust V - SUB KEY and V - KEY so that the lean in the E block is eliminated. Repeat these adjustments until any lean in the upper and lower sections of the screen is eliminated.	The lean in the E block of the screen is corrected. The lines in the upper and lower sections of the screen move in the same direction.
V - KEY * 1				E block	Adjust to eliminate the lean in the attention-point blocks on the screen shown in the figure to the left.		The lean in the E block of the screen is corrected. The upper and lower sections move symmetrically in relation to the center line.
V - MID KEY * 1				D block	Adjust to eliminate any lean at the attention-point blocks on the screen shown in the figure to the left.		The lean in the upper and lower sections (D and E blocks) of the screen is corrected. The upper and lower sections move symmetrically in relation to the center line.

* 1: V - MID KEY and V - KEY work relative to each other. Be sure to adjust them alternately.
* 2: V - SUB - KEY substantially differs from that of the previous-year model SD - P4053 - K in picture movement and attention points.

Note:
▷————◁ : Line which does not move.



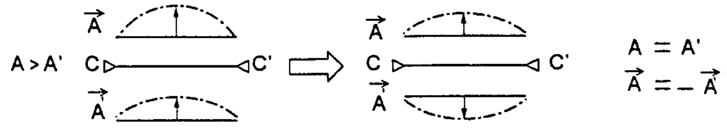
Note:
▷————◁ : Center horizontal line
———— : Reference line
-·-·-·-·- : Leaned line

$\vec{A}$: Vector of the deviation in the upper section of the screen
$\vec{A}$: Vector of the deviation in the lower section of the screen
A : Scalar quantity of the deviation in the upper section of the screen
A' : Scalar quantity of the deviation in the lower section of the screen

Fig. 7-14 Example of Vertical Lean Adjustment

- Distortion Adjustment in the Vertical Direction

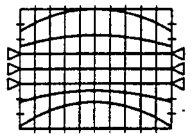
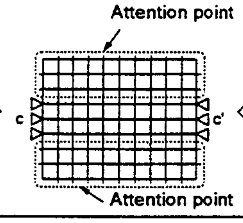
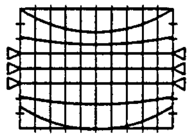
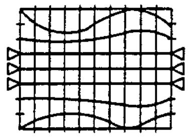
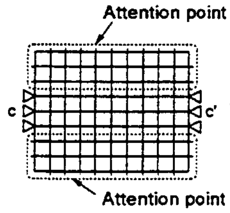
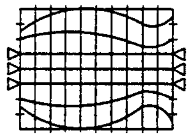
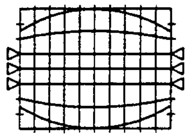
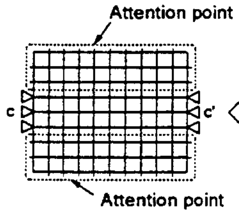
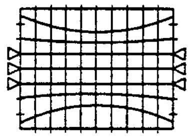
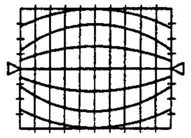
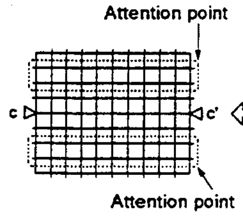
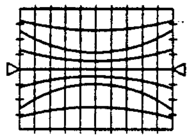
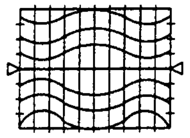
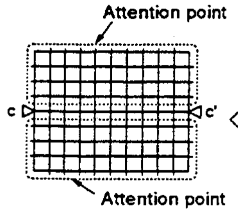
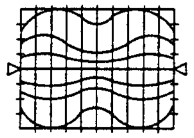
See Table 7-9 for the picture movements and general information on this adjustment.
In this adjustment, distortion on the screen is corrected. While adjusting V-SUB PIN, the upper and lower sections of the screen move in the same direction. While adjusting V-MID PIN, V-PIN, V-S C PIN and V-4TH PIN, the upper and lower sections move symmetrically in relation to the center line. Adjust them so that the distortion in the upper and lower sections of the screen is eliminated and the horizontal lines in both sections are straight.



Note:
C▷————◁C' : Center horizontal line
———— : Reference line
-·-·-·-·- : Distorted line
$\vec{A}$: Vector of the deviation in the upper section of the screen
$\vec{A}$: Vector of the deviation in the lower section of the screen
A : Scalar quantity of the deviation in the upper section of the screen
A' : Scalar quantity of the deviation in the lower section of the screen

Fig. 7-15 Example of V-SUB PIN Adjustment

Table 7-9 Distortion Adjustment in the Vertical Direction

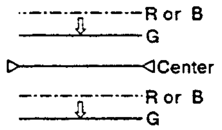
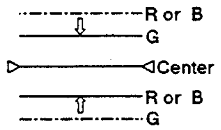
Item	Deviating Picture	Corrected Picture	Deviating Picture	Attention Point on the Screen During Adjustment	Adjustment Point		Remarks
V-SUB PIN				E block	Adjust so that any bowed lines in the attention-point blocks on the screen shown in the figure to the left are straight. If straight lines cannot be obtained, move the upper and lower sections as shown in Fig. 7-15 in the opposite directions to the same extent from the center horizontal line. Adjust with V-PIN so that the lines are straight.		The bowed lines are corrected in the E block of the screen. As shown in the figure to the left, the upper and lower sections move in the opposite directions.
V-S C PIN				E block	Adjust so that any wavy lines in the attention-point blocks on the screen shown in the figure to the left are straight.	First adjust D block with V-MID PIN while setting the center-line side of E blocks to a roughly-adjusted state. Then adjust E block with V-PIN. If there is waving distortion, adjust V-4TH PIN and V-S C PIN. Repeat these adjustments until all the horizontal lines in both upper and lower sections of the screen are straight.	The wavy lines (third-order) are corrected in the E block on the screen. As shown in the figure to the left, the upper and lower sections move symmetrically in relation to the center line.
V-PIN				E block	Adjust so that any bowed lines in the attention-point blocks on the screen shown in the figure to the left are straight.		The bowed lines are corrected in the E block on the screen. As shown in the figure to the left, the upper and lower sections move symmetrically in relation to the center line.
V-MID PIN				D block and the center line side of E block. (Especially the center line side of the E block)	Adjust so that any bowed lines in the attention-point blocks on the screen shown in the figure to the left are straight.		The bowed lines are corrected on the center line side of E block on the screen. As shown in the figure to the left, the upper and lower sections move symmetrically in relation to the center line.
V-4TH PIN				D and E blocks	Adjust so that any wavy lines in the attention-point blocks on the screen shown in the figure to the left are straight.		The wavy lines (fourth-order) are corrected in the upper and lower sections (D and E blocks) of the screen. As shown in the figure to the left, the upper and lower sections move symmetrically in relation to the center line.

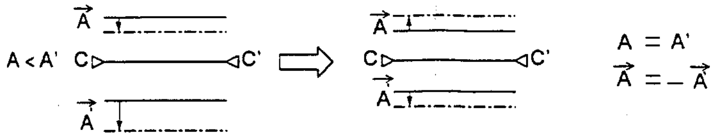
Note:
▷————◁ : Line which does not move at all.

- Line-Interval Adjustment in the Vertical Direction

See Table 7-10 for the picture movements and general information on this adjustment.
In this adjustment, the intervals of the horizontal lines in the upper and lower sections of the screen are corrected with V-LIN, V-SIZE and V-SUB LIN. Converge the horizontal lines in the upper and lower sections of the screen in the green horizontal lines which have been set for reference.
The differences between V-LIN, V-SIZE and V-SUB LIN are shown in Table 7-11.

Table. 7-11 Difference Between Adjustment Items

Item	Screen Example	Remarks
V-LIN		V-LIN should be adjusted when the upper and lower sections of the screen show deviation in the same direction.
V-SIZE and V-SUB LIN		V-SIZE and V-SUB LIN should be adjusted when the upper and lower sections of the screen show the upper and lower sections move symmetrically in relation to the center line.

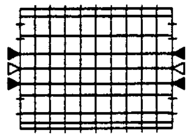
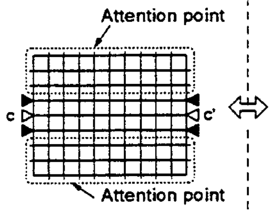
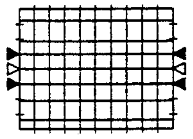
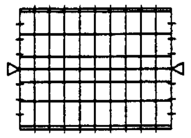
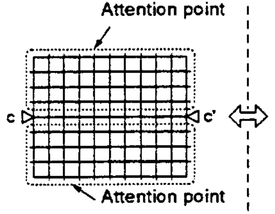
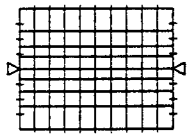
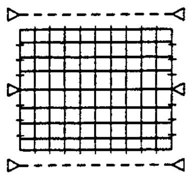
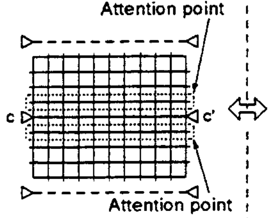
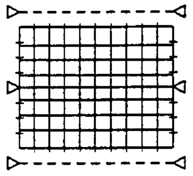


Note:
▷————◁ : Center horizontal line
———— : Reference line
-·-·-·-·- : Deviating line

$\vec{A}$: Vector of the deviation in the upper section of the screen
$\vec{A'}$: Vector of the deviation in the lower section of the screen
A : Scalar quantity of the deviation in the upper section of the screen
A' : Scalar quantity of the deviation in the lower section of the screen

Fig. 7-16 Example of V-LIN Adjustment

Table 7-10 Line-Interval Adjustment in the Vertical Direction

Item	Deviating Picture	Corrected Picture	Deviating Picture	Attention Point on the Screen During Adjustment	Adjustment Point		Remarks
V-LIN				E block	Observe the movements with V-SIZE and V-SUB LIN and move the lines in the upper and lower sections in the opposite directions to the same extent. (See Fig. 7-16.) When the convergence on the green lines is achieved, further adjustments with V-SIZE and V-SUB LIN are not necessary.		The line intervals are corrected centering the D and E blocks on the screen. As shown in the figure to the left, the lines in the upper and lower sections of the screen move centering the respective E block.
V-SIZE				D and E blocks	Converge the horizontal lines in the green horizontal lines which have been set for the reference.	Adjust the horizontal lines in the upper and lower sections of the screen with V-SIZE. If the lines in the D block cannot be converged, adjust V-SUB LIN.	The line intervals in the upper and lower sections (D and E blocks) of the screen are corrected. As shown in the figure to the left, the line intervals in the upper and lower sections of the screen change with the center line as the axis.
V-SUB LIN				D block	Converge the horizontal lines in the attention-point sections in the green horizontal lines which have been set for reference.		The line intervals in the D block on the screen are corrected. As shown in the figure to the left, the lines in the upper and lower sections move centering the respective D block in the same manner as with V-SIZE.

Note:
▷————◁ : Line which does not move at all.
▶————◀ : Line which hardly moves.
▷- - - - - - -◁ : Line which does not move out of screen.

7.5 TUNER SECTION

- No adjustment required when replacing the assembly.
- Perform the adjustment after the video and control section adjustments.
- Connection diagram is refered to Fig. 7-18.
- Adjustment points and test points are shown in Fig. 7-6.
- Perform the adjustment set to the TEST mode (Note 1).
- Perform the adjustment by using the channel 9 unless otherwise noted.
- Video and audio input signals are described in the below.

Note 1 ;

How to set the TEST mode.
- Short-circuit TP-TEST and GND in the TUNER-VIDEO assembly.
- Disconnect the AC power cord from the AC outlet, then connect it again.

How to release the TEST mode.
- Release the short-circuit TP-TEST and GND in the TUNER-VIDEO assembly.
- Disconnect the AC power cord from the AC outlet,then connect it again.

Ⓝ ; No signal
Video signal
V ① ; f_V = EIA color bar, 60 dB μ V
Audio signal (STEREO);
dbx noise reduction ON, PRE-EMPHASIS ON

S ① ; f_A = 300Hz,30% MOD,
Lch(or R ch) only, 54dB μ V
S ② ; f_A = 5KHz, 30% MOD
Lch(or R ch) only, 54dB μ V

Video system

Step No.	Adjustment Item	Input signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
1	Video level adjustment	V①	Ⓝ	VR 4801 (T)	Adjust the output of the VIDEO REC terminal on the rear panel to 2Vp-p ± 0.15V (Not 75 Ω terminated.)

Audio system

Step No.	Adjustment Item	Input signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
1	STEREO VCO	Ⓝ	Ⓝ	Remote control unit	● Press the numeric key [2] of the remote control unit for ST VCO adjustment mode. ● Measure the Rch output frequency of the OUTPUT REC terminal and adjust with the VOL ⊞ and ⊟ keys so that the frequency becomes closest to the 62.936kHz.
2	SAP VCO	Ⓝ	Ⓝ	Remote control unit	● Connect the Q4806 base to GND and input the 78.67 kHz ; 147 mVrms signal to TP-MPX. ● Press the numeric key [3] of the remote control unit. ● Wait until "COMPLETE!" is displayed at part Ⓐ of the screen (see Fig. 7-17). ● If "TRY AGAIN!!" is displayed, adjust again using the following method. 1. Press the VOL ⊞ and ⊟ keys and adjust so that the value at part Ⓑ of the screen (see Fig. 7-17) becomes 25 or 05. 2. Press the VOL ⊟ key slowly once at a time until the value at part Ⓑ of the screen changes from 25 or 05 to a different value. 3. Press the VOL ⊞ key slowly once at a time while counting it until the value at part Ⓑ of the screen changes from 25 or 05 to a different value. 4. Press the VOL ⊟ for half the number of times counted. 5. If the counted number is odd, subtract 1 from it and press the VOL ⊟ key for half of the resultant number.
3	STEREO LPF adjustment	Ⓝ	Ⓝ	Remote control unit	● Connect the Q4806 base to GND and input the 9.4 kHz ; 600 mVrms signal to TP-MPX. ● Press the numeric key [4] of the remote control unit. ● Wait until "COMPLETE!" is displayed at part Ⓐ of the screen (see Fig. 7-17). ● If "TRY AGAIN!!" is displayed, adjust again using the following method. 1. Press the VOL ⊞ and ⊟ keys and adjust so that the value at part Ⓑ of the screen (see Fig. 7-17) becomes 31. 2. Press the VOL ⊟ key slowly once at a time until the value at part Ⓑ of the screen changes from 31 to a different value. 3. Press the VOL ⊞ key slowly once at a time while counting it until the value at part Ⓑ of the screen changes from 31 to a different value. 4. Press the VOL ⊟ for half the number of times counted. 5. If the counted number is odd, subtract 1 from it and press the VOL ⊟ key for half of the resultant number.
4	SAP LPF adjustment	Ⓝ	Ⓝ	Remote control unit	● Connect the Q4806 base to GND and input the 88 kHz ; 120 mVrms signal to TP-MPX. ● Press the numeric key [5] of the remote control unit. ● Wait until "COMPLETE!" is displayed at part Ⓐ of the screen (see Fig. 7-17). ● If "TRY AGAIN!!" is displayed, adjust again using the following method. 1. Press the VOL ⊞ and ⊟ keys and adjust so that the value at part Ⓑ of the screen (see Fig. 7-17) becomes 33. 2. Press the VOL ⊟ key slowly once at a time until the value at part Ⓑ of the screen changes from 33 to a different value. 3. Press the VOL ⊞ key slowly once at a time while counting it until the value at part Ⓑ of the screen changes from 33 to a different value. 4. Press the VOL ⊟ for half the number of times counted. 5. If the counted number is odd, subtract 1 from it and press the VOL ⊟ key for half of the resultant number.
5	* Separation adjustment (WIDEBAND)	V①	S①	Remote control unit	● Press the numeric key [7] of the remote control unit. ● Adjust the output of the OUTPUT REC terminal on the rear panel to minimum level. (Adust the R ch level becomes mimimun at the Lch input and the Lch level becomes minimum at the Rch input.)
6					
7	Repeat step 5 and 6 to obtained best separation.				
8	* Separation adjustment (SPECTRAL)	V①	S②	Remote control unit	● Press the numeric key [6] of the remote control unit. ● Adjust the output of the OUTPUT REC terminal on the rear panel to minimum level. (Adust the R ch level becomes mimimun at the Lch input and the Lch level becomes minimum at the Rch input.)
9					
10	Repeat step 8 and 9 to obtained best separation.				
11	Repeat step 5 , 6 , 8 and 9 to obtained best separation.				

* : When performing the separation adjustment, be sure to perform WIDE BAND adjustment first.

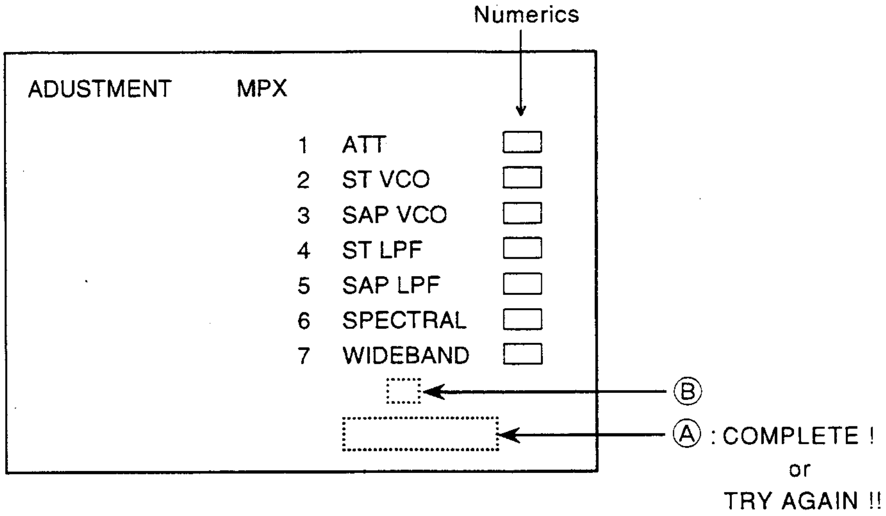
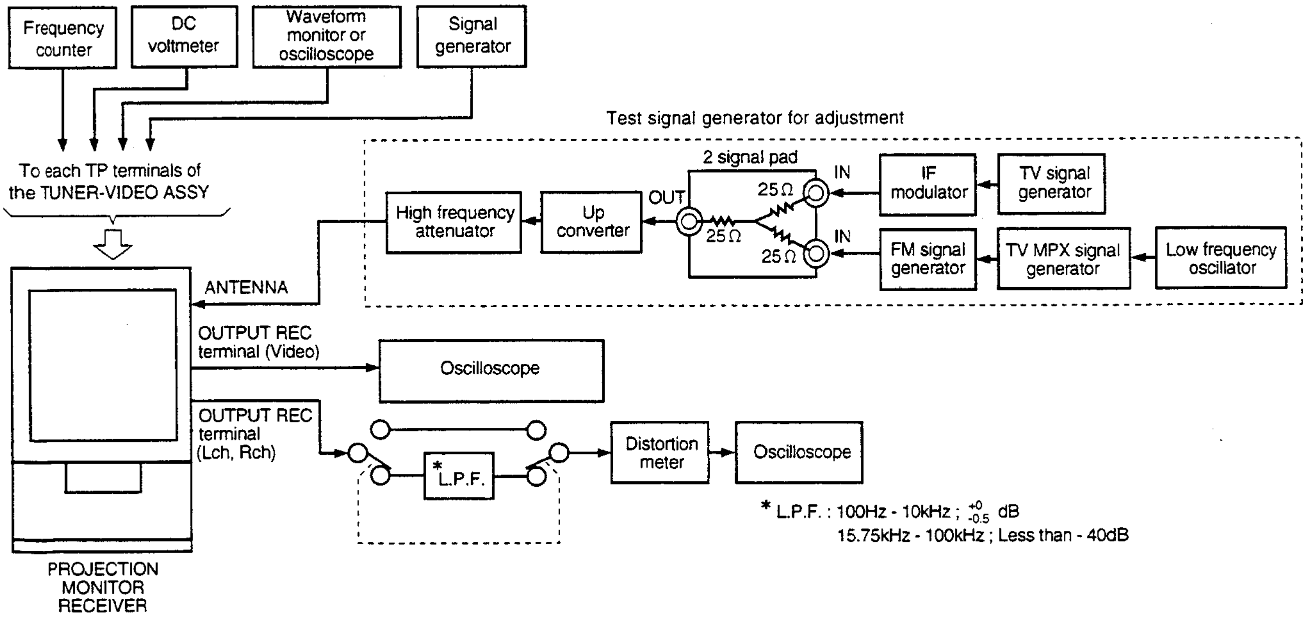

Numerics
ADUSTMENT MPX
1 ATT
2 ST VCO
3 SAP VCO
4 ST LPF
5 SAP LPF
6 SPECTRAL
7 WIDEBAND
Ⓑ
Ⓐ : COMPLETE !
or
TRY AGAIN !!

Fig. 7-17 Display of ADJUSTMENT MPX mode screen


Frequency counter
DC voltmeter
Waveform monitor or oscilloscope
Signal generator
To each TP terminals of the TUNER-VIDEO ASSY
Test signal generator for adjustment
2 signal pad
OUT
IN
IN
25Ω
25Ω
25Ω
IF modulator
TV signal generator
FM signal generator
TV MPX signal generator
Low frequency oscillator
High frequency attenuator
Up converter
ANTENNA
OUTPUT REC terminal (Video)
Oscilloscope
OUTPUT REC terminal (Lch, Rch)
*L.P.F.
Distortion meter
Oscilloscope
PROJECTION MONITOR RECEIVER

* L.P.F. : 100Hz - 10kHz ; $^{+0}_{-0.5}$ dB
15.75kHz - 100kHz ; Less than - 40dB

Fig. 7-18 Conection diagram when adjusting the tuner section

8. REPLACING THE CRT ASSY

Serviceman Warning
When replacing the CRT assy,turn off the power,unplug the AC plug and let the unit discharge for more than 1 minute.

The anode cables of the CRT assy R,G and B in PLOJECTION MONITOR RECEIVER are connected in series as shown in Fig. 1.
When repracing the CRT assy,the anode cable have to be cut.

Note:
Since the anode cables for the CRT assy to service supplies are only available in half lengths,either cut longer lengths, or join older lengths of cable to ensure that the original cable length is used.

Table 1 Cable disconnecting methods

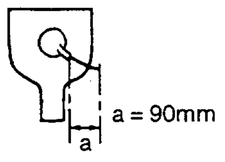
Cable	Replacement CRT assy		
	When CRT assy B is replaced	**When CRT assy G is replaced**	**When CRT assy R is replaced**
Cable ⓐ	—	—	Disconnect the anode cable from the FBT. (Refer to "7.3 ANODE VOLTAGE MEASURING METHOD")
Cable ⓑ	Leave it as is.	Cut a place 20mm from the exact center towards the CRT assy G.	Cut a place 20mm from the exact center towards the CRT assy R.
Cable ⓒ	Cut a place 20mm from the exact center towards the CRT assy B.	Cut a place 20mm from the exact center towards the CRT assy G.	Leave it as is.

Note: Do not cut other cables by mistake.

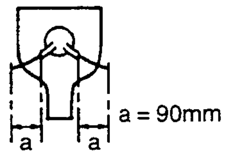
7.1 WHEN REPLACING THE CRT ASSY

Unplug the AC plug and let the unit discharge for more than 1 minute,then cut the anode cable according to Table 1.

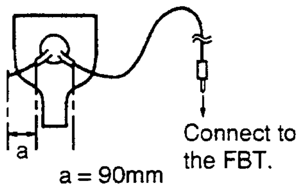
Each CRT assy supplied as a spare part is as shown below.



CRT ASSY B



CRT ASSY G



CRT ASSY R

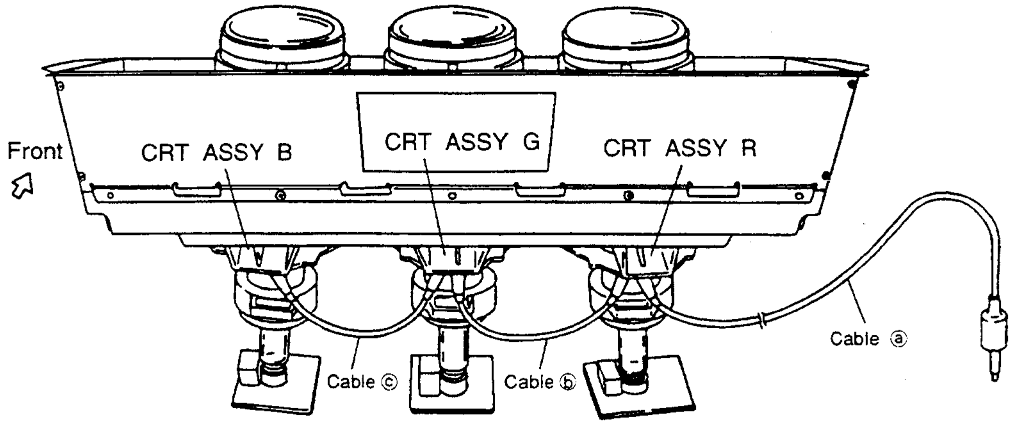
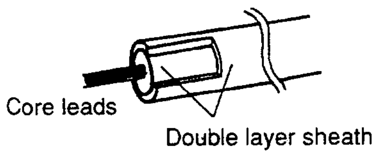
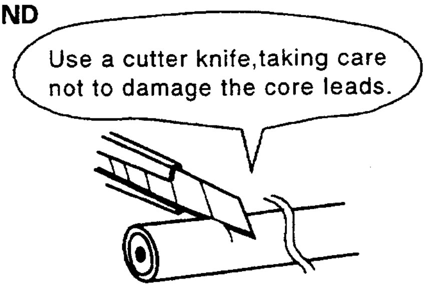
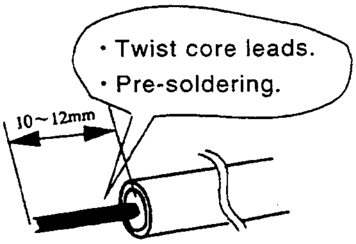


Fig. 1 Connection diagram of the CRT assemblies

■ANODE CABLE STRUCTURE AND SHEATH PEELING


Core leads
Double layer sheath


Use a cutter knife,taking care not to damage the core leads.

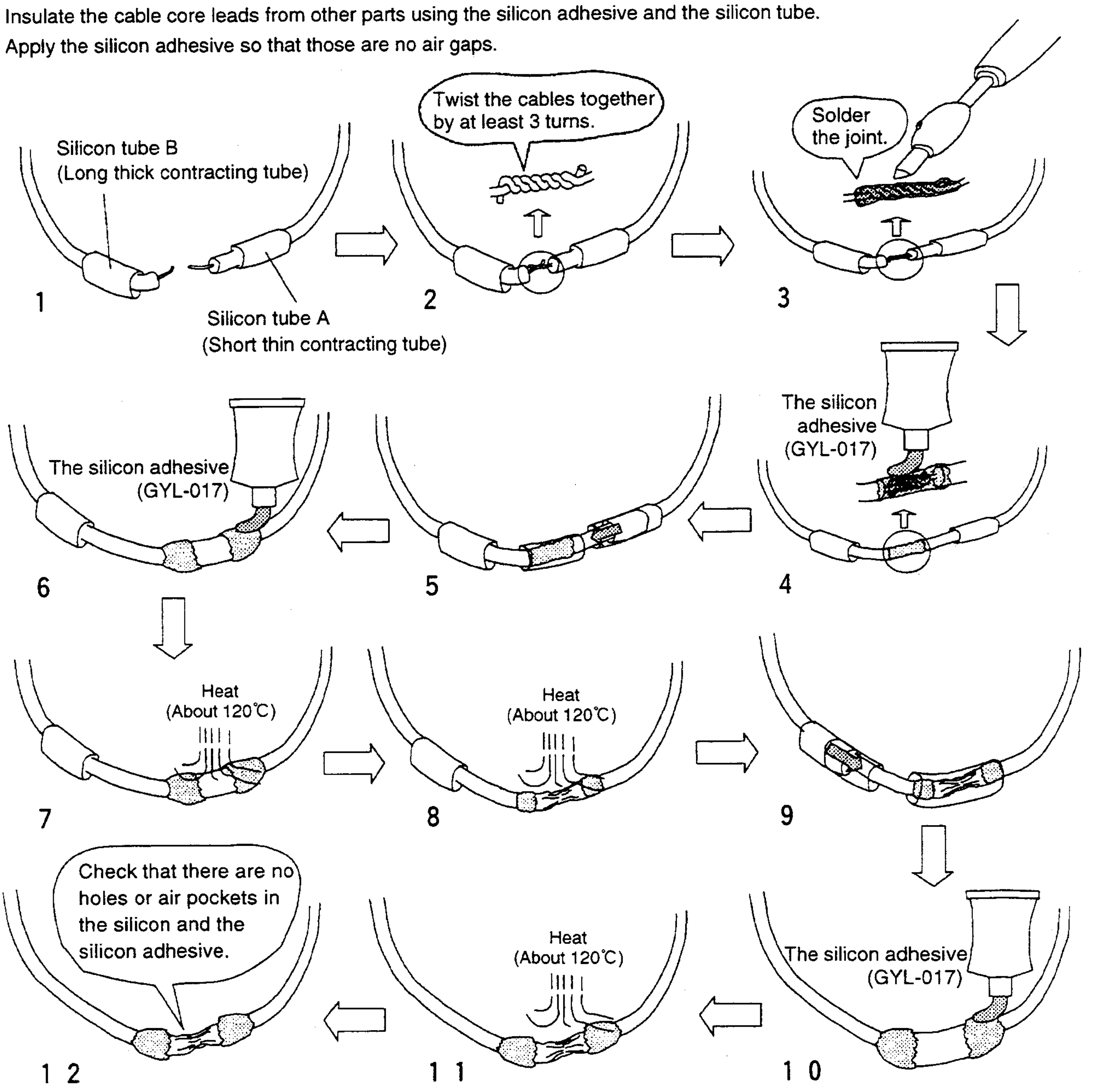

· Twist core leads.
· Pre-soldering.
10~12mm

■ANODE CABLE JOINING PROCEDURE

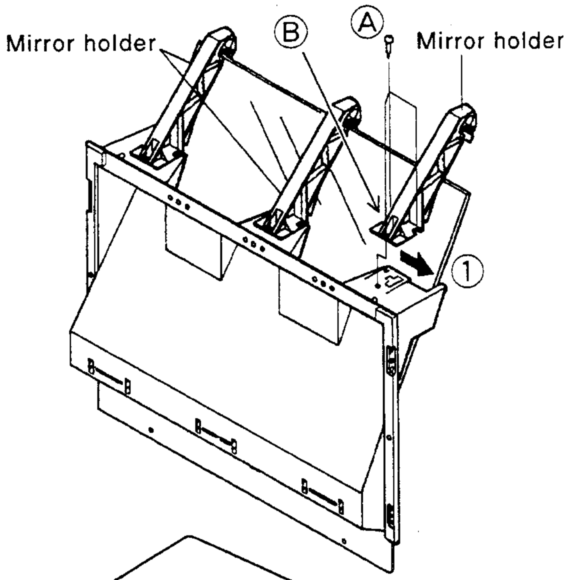
(The silicon tube is packed with CRT ASSY. For the silicon adhesive,be sure to use silicon adhesive part number GYL-017.)

●CAUTION When connecting the anode cable, pay attention to the following.

- Take care not damage the anode cable sheath.
- Insulate the cable core leads from other parts using the silicon adhesive and the silicon tube.
- Apply the silicon adhesive so that those are no air gaps.

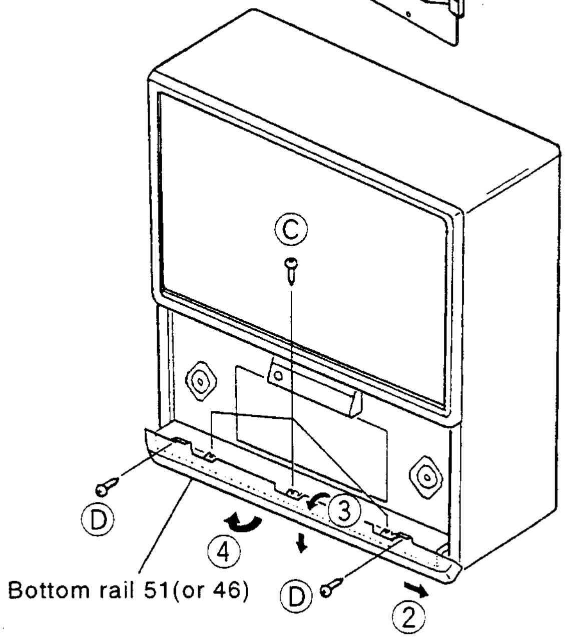

Silicon tube B
(Long thick contracting tube)
1
Silicon tube A
(Short thin contracting tube)
Twist the cables together by at least 3 turns.
2
Solder the joint.
3
The silicon adhesive
(GYL-017)
4
5
The silicon adhesive
(GYL-017)
6
Heat
(About 120℃)
7
Heat
(About 120℃)
8
9
The silicon adhesive
(GYL-017)
1 0
Heat
(About 120℃)
1 1
Check that there are no holes or air pockets in the silicon and the silicon adhesive.
1 2

9. DISASSEMBLY



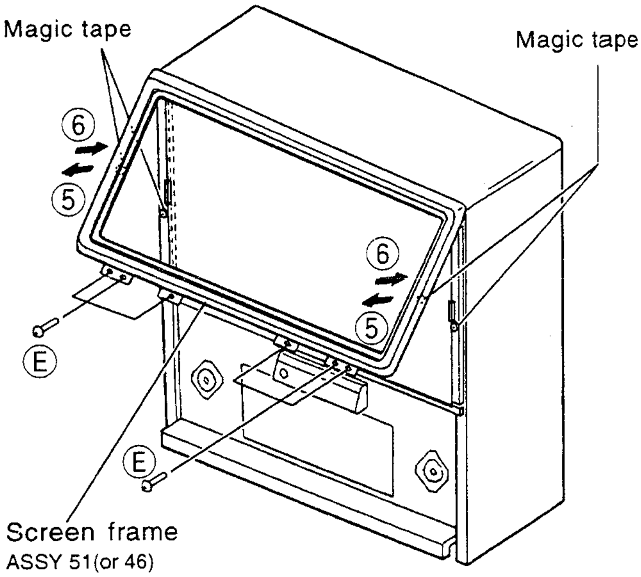
●REMOVAL OF MIRROR HOLDER

1. Remove the three stopper screws Ⓐ of the mirror holder.
2. Slide the mirror holder in arrow direction ① and remove it upwards.(also slide the other mirror holder in the same direction and remove it upwards)When sliding the mirror holder, slide slowly by hitting base Ⓑ of the mirror holder gently with the shank of a screwdriver.



●REMOVAL OF BOTTOM RAIL 51(or 46)

1. Remove the three stopper screws Ⓒ and two stopper screws Ⓓ of the bottom rail 51(or 46).
2. Slide the bottom rail 51(or 46) in arrow direction ②.
3. Remove the bottom rail 51(or 46) while rotating its top part in arrow direction ③ and bring it down.
4. Remove the bottom rail 51(or 46) while rotating its bottom part in arrow direction ④ and bring it towards you.



●REMOVAL OF SCREEN FRAME ASSY 51(or 46)

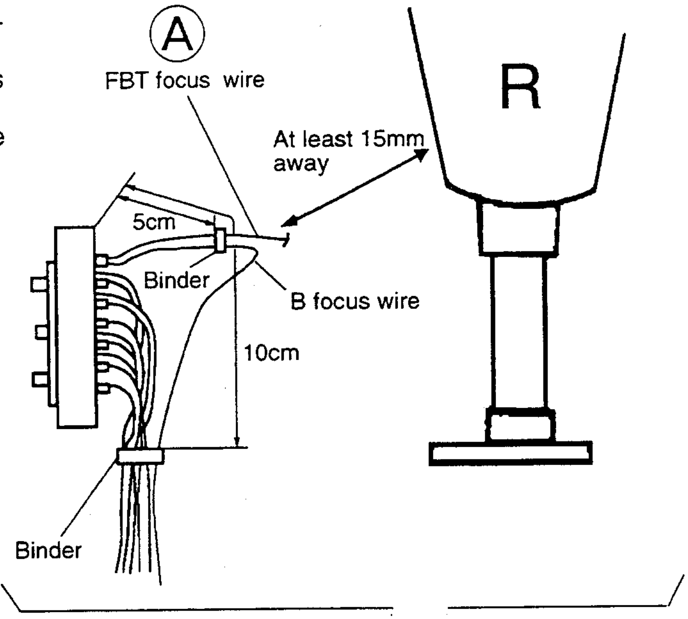
1. Remove the six stopper screws Ⓔ of the screen frame ASSY 51(or46).
2. Pull the magic tape of the screen frame ASSY 51(or 46) in arror directions ⑤ to bring it away from the cabinet.
3. Remove the screen frame ASSY 51(or 46) upwards.

●MOUNTING OF SCREEN FRAME ASSY 51(or 46)

1. Hook the top part of the screen frame ASSY 51(or 46) and attach it.
2. Push the magic tape of the screen frame ASSY 51(or 46) in arrow directions ⑥ to fix it to the cabinet.
3. Fix the six stopper screws Ⓔ of the screen frame ASSY 51(or46).

10. WIRING DIAGRAM

Reconnect any disconnected lead wires of the Projection monitor receiver.
The important points for connection of the lead wires are shown below.
You may find that they were connected differently. Be sure reconnect the lead wires as they were.


Ⓐ
FBT focus wire
At least 15mm away
R
5cm
Binder
B focus wire
10cm
Binder

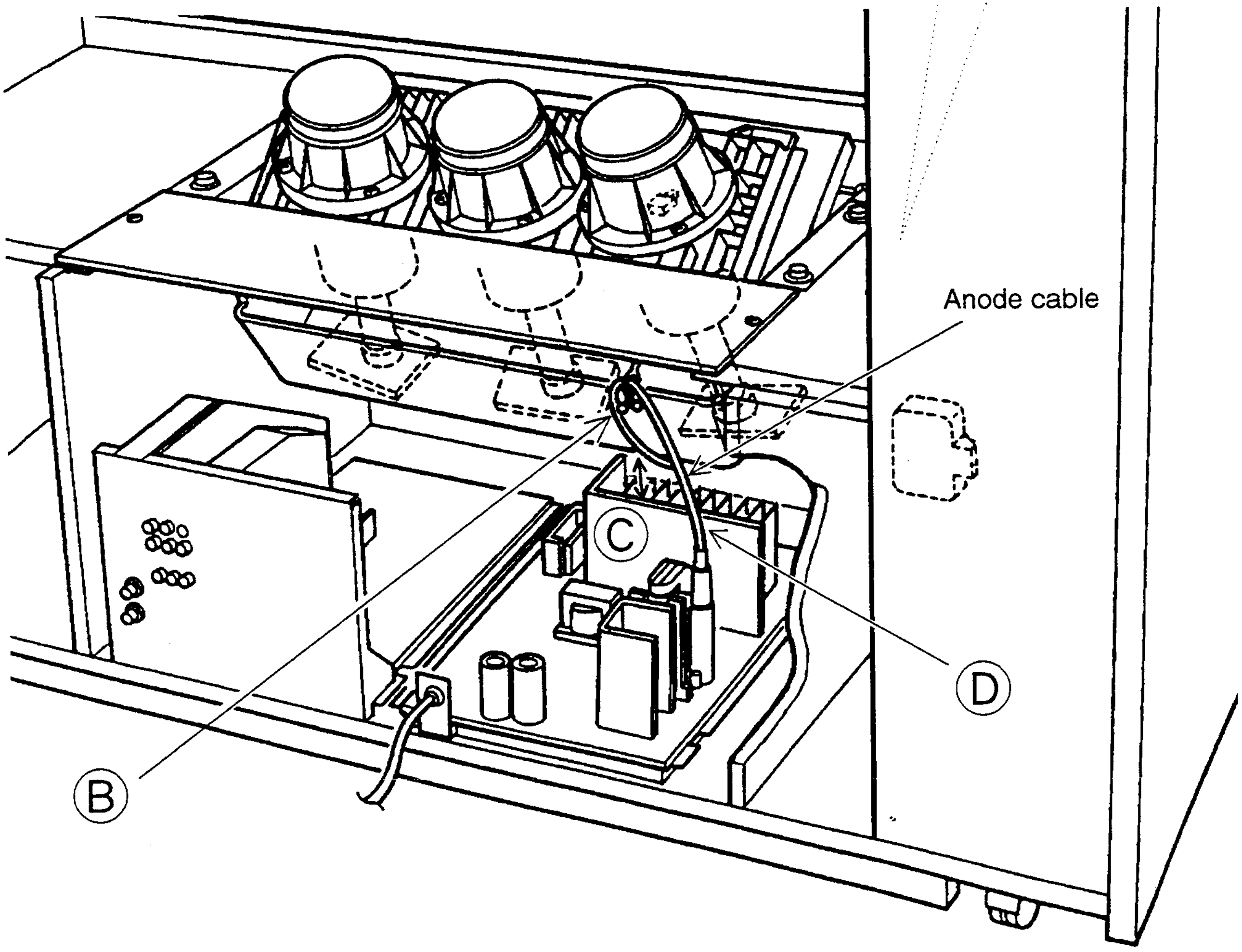
Note:

Ⓐ: FBT focus wire and other parts should be at least 15mm away from any other parts.

Ⓑ: Loop with a radius of 30mm or more.

Ⓒ: The anode cable and other parts should be at least 15mm away from any other parts.

Ⓓ: Loop with a radius of 50mm or more.


Anode cable
Ⓒ
Ⓓ
Ⓑ

11. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

■ PD5300A (IC2001)

• CLOSED CAPTION SIGNAL DETECTOR AND CHARACTER DECODER

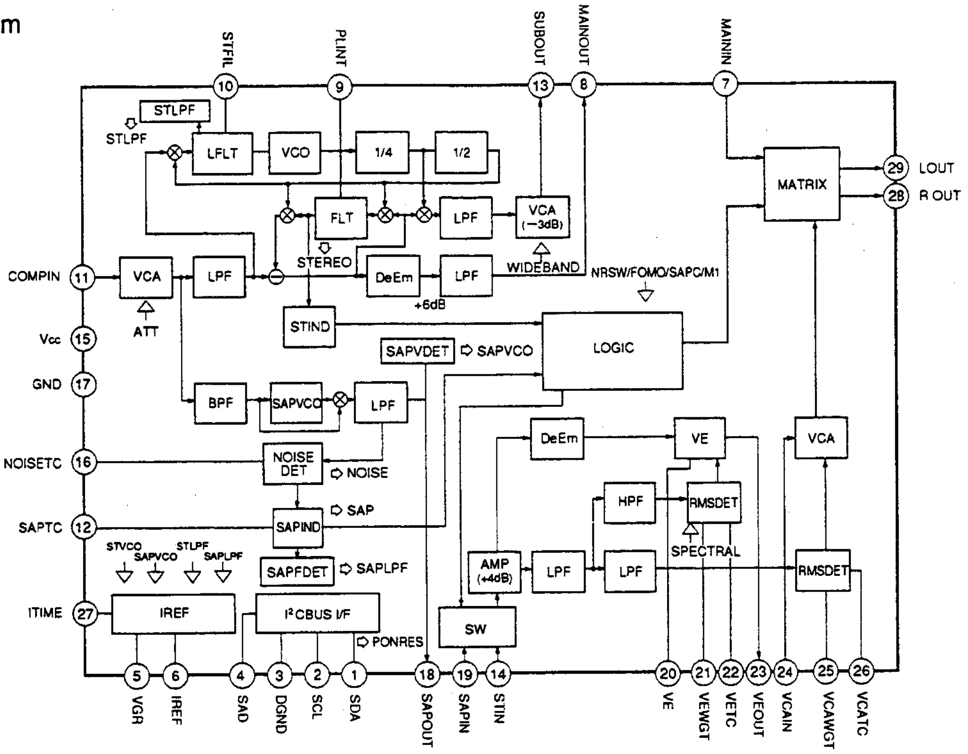
• Pin Function

Note) I : CMOS input O : CMOS output N : N ch open dolein output

No.	Name	I/O	Function	No.	Name	I/O	Function
1	HSYNC	I	Horizontal sync. signal input.	27	VCC	I	+5V power supply voltage
2	VSYNC	I	Vertical sync. signal input.	28	OSC2	O	Input/output pins of the clock generator circuit for OSD. Connect the 12MHz ceramic resonator.
3	R IN	I	R input	29	OSC1	I	
4	G IN	I	G input	30	RESET	I	Reset input. Input "L" for reset.
5	B IN	I	B input	31	NOT USED	I	+5V pull-up
6	BLK IN	I	Blanking input	32			
7	NOT USED	I	5V pull-up	33			
8				34			
9				35			
10				36			
11				37			
12				38			
13				39			
14				40			
15	CC ENB	I	Serial data enable input	41			
16	SIN	I	Serial data input	42			
17	SCLK	I	Serial clock input	43			
18	NOT USED	I	GND pull-down	44			
19	VHOLD	–	For data slicer (VHOLD-VSS 0.1 μF)	45			
20	VIN	I	For data slicer (VIN-VOUT 0.1 μF)	46			
21	VOUT	O		47			
22	CVIN	I	Video input for data slicer	48			
23	CNVSS	I	GND	49	BLK OUT	O	Blanking output
24	XIN	I	Input/output pins of the main clock genaration circuit. Connect the 8MHz ceramic resonator.	50	B OUT	O	B output
25	XOUT	O		51	G OUT	O	G output
26	VSS	I	GND	52	R OUT	O	R output

■CXA1734S (IC4901)
US MPX DECODER

●Block Diagram

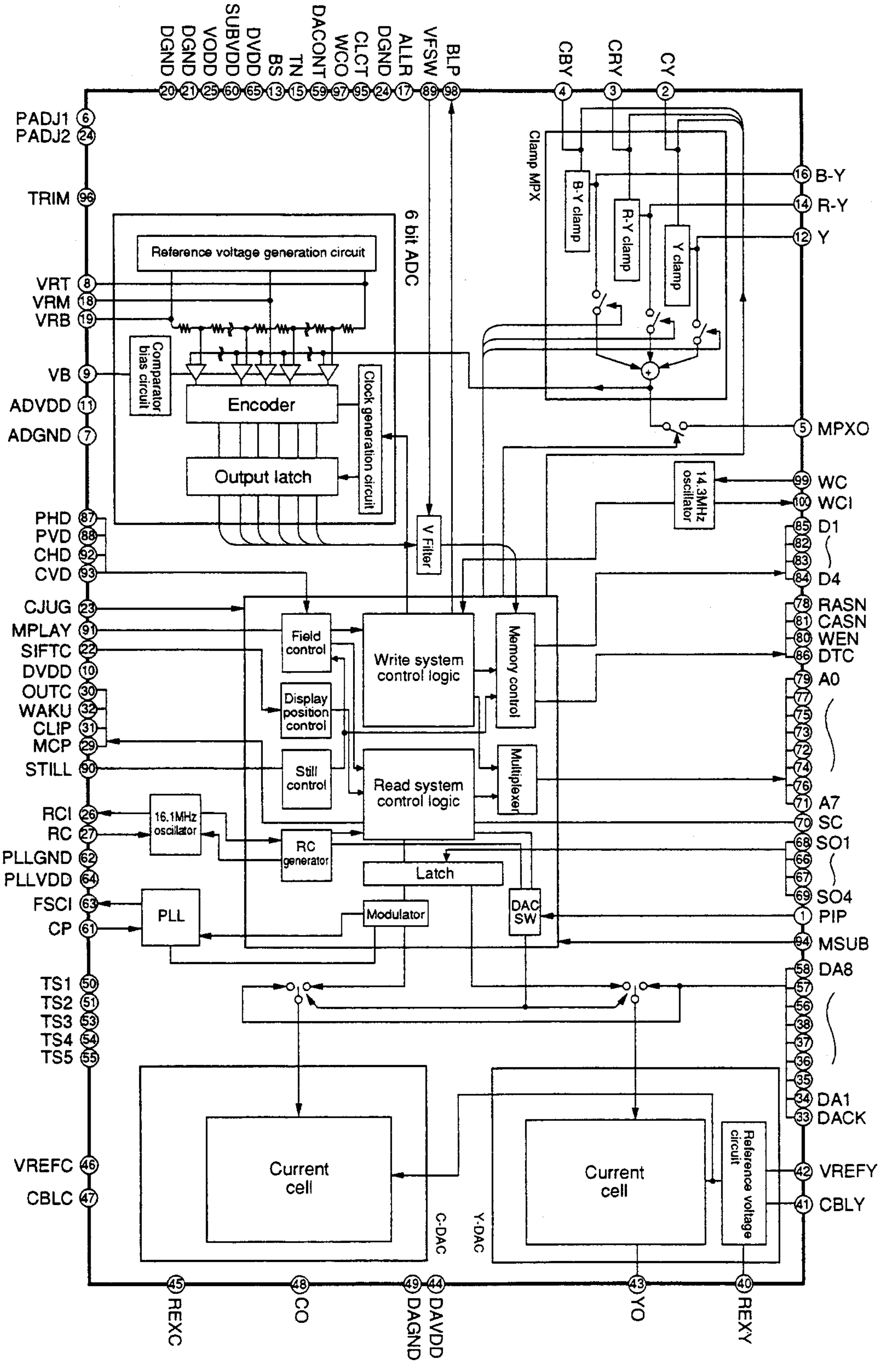

STFIL
PLINT
SUBOUT
MAINOUT
MAININ
10
9
13
8
7
STLPF
STLPF
LFLT
VCO
1/4
1/2
FLT
LPF
VCA
(−3dB)
MATRIX
29 LOUT
28 R OUT
STEREO
DeEm
LPF
+6dB
WIDEBAND
NRSW/FOMO/SAPC/M1
COMPIN 11
VCA
LPF
ATT
STIND
SAPVDET
SAPVCO
LOGIC
Vcc 15
GND 17
BPF
SAPVCO
LPF
DeEm
VE
VCA
NOISETC 16
NOISE DET
NOISE
HPF
RMSDET
SAP
SAPTC 12
SAPIND
SPECTRAL
STVCO
STLPF
SAPVCO
SAPLPF
SAPFDET
SAPLPF
AMP
(+4dB)
LPF
LPF
RMSDET
ITIME 27
IREF
I²CBUS I/F
PONRES
SW
5
6
4
3
2
1
18
19
14
20
21
22
23
24
25
26
VGR
IREF
SAD
DGND
SCL
SDA
SAPOUT
SAPIN
STIN
VE
VEWGT
VETC
VEOUT
VCAIN
VCAWGT
VCATC

●Pin Function

No.	NAME	FUNCTION
1	SDA	Serial data input/output pin.
2	SCL	Serial clock input pin.
3	DGND	GND of digital section.
4	SAD	Slave address control switch. By changing the voltage supplied to this pin, the slave address is selected.
5	VGR	Band gap reference output pin.
6	IREF	Sets the filter and VCO reference currents. The adjustment is performed with the BUS DATA according to the current flowing to this pin.
7	MAININ	Receives the signal (L+R) from the MAINOUT of Pin 8.
8	MAINOUT	Outputs the L+R signal.
9	PLINT	Integration pin of the pilot cancel circuit loop filter.
10	STFIL	Integration pin of the stereo block PLL loop filter.
11	COMPIN	Receives the audio multiple signal.
12	SAPTC	Sets the time-constant of the SAP carrier detection circuit.
13	SUBOUT	Outputs the L−R signal.
14	STIN	Receives the signal (L−R) from SUBOUT of Pin 13.
15	Vcc	Power supply voltage pin.
16	NOISETC	Sets the time-constant of the NOISE detection circuit.
17	GND	Analog GND pin.
18	SAPOUT	SAP FM detector output pin.
19	SAPIN	Receives the signal (SAP) from SAPOUT of Pin 18.
20	VE	Variable de-emphasis integration pin
21	VEWGT	Superimposing pin for the variable de-emphasis control effective value detection circuit.
22	VETC	Determines the return time-constant for the variable de-emphasis control effective value detection circuit.
23	VEOUT	Variable de-emphasis output pin.
24	VCAIN	VCA input pin. Receives the variable de-emphasis output signal of Pin 23 via the coupling capacitor.
25	VCAWGT	Superimposing pin for the VCA control effective value detection circuit.
26	VCATC	Determines the return time-constant for the VCA control effective value detection circuit.
27	ITIME	Sets the reference current for the effective value detection timing current. The timing current determines the return time-constant and variable de-emphasis characteristics of the detection circuit.
28	ROUT	Rch output pin.
29	LOUT	Lch output pin.
30	NC	—

■ HD49412 FS (IC3502)
P IN P MEMORY CONTROLLER

●Block Diagram


DGND 20
DGND 21
VODD 25
SUBVDD 60
DVDD 65
BS 13
TN 15
DACONT 59
WCO 97
CLCT 95
DGND 24
ALLR 17
VFSW 89
BLP 98
CBY 4
CRY 3
CY 2
PADJ1 6
PADJ2 24
TRIM 96
VRT 8
VRM 18
VRB 19
VB 9
ADVDD 11
ADGND 7
PHD 87
PVD 88
CHD 92
CVD 93
CJUG 23
MPLAY 91
SIFTC 22
DVDD 10
OUTC 30
WAKU 32
CLIP 31
MCP 29
STILL 90
RCI 26
RC 27
PLLGND 62
PLLVDD 64
FSCI 63
CP 61
TS1 50
TS2 51
TS3 53
TS4 54
TS5 55
VREFC 46
CBLC 47
REXC 45
CO 48
DAGND 49
DAVDD 44
YO 43
REXY 40
B-Y 16
R-Y 14
Y 12
MPXO 5
WC 99
WCI 100
D1 85
82
83
D4 84
RASN 78
CASN 81
WEN 80
DTC 86
A0 79
77
75
73
72
74
76
A7 71
SC 70
SO1 68
66
67
SO4 69
PIP 1
MSUB 94
DA8 58
57
56
38
37
36
35
DA1 34
DACK 33
VREFY 42
CBLY 41
Reference voltage generation circuit
6 bit ADC
Comparator bias circuit
Encoder
Output latch
Clock generation circuit
Clamp MPX
B-Y clamp
R-Y clamp
Y clamp
+
14.3MHz oscillator
V Filter
Field control
Display position control
Still control
Write system control logic
Read system control logic
Memory control
Multiplexer
16.1MHz oscillator
RC generator
Latch
PLL
Modulator
DAC SW
Current cell
C-DAC
Y-DAC
Current cell
Reference voltage circuit

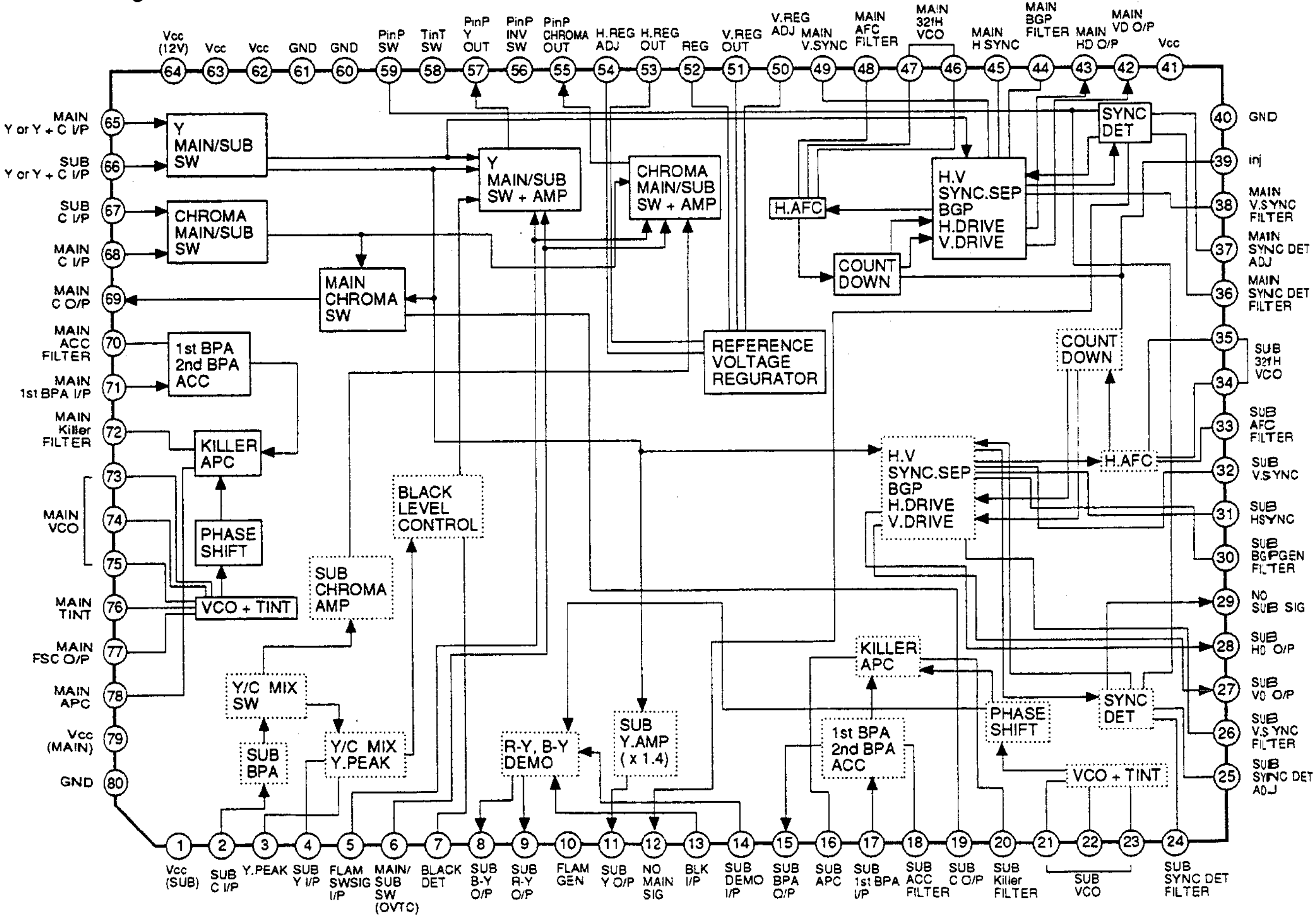
●Pin Function

No.	NAME	I/O	FUNCTION	No.	NAME	I/O	FUNCTION
1	PIP	I	P-in-P mode input	39	(NC)	—	No connection
2	CY	—	Y signal clamping filter	40	REXY	—	DAC external resistor connection
3	CRY	—	R-Y signal clamping filter	41	CBLY	—	DAC bypass capacitor connection (1)
4	CBY	—	B-Y signal clamping filter	42	VREFY	I	DAC reference voltage input (1)
5	MPXO	—	Test-use pin	43	YO	O	Y signal output
6	PADJ1	I	Sub picture output timing control (1)	44	DAVDD	—	DAC VDD
7	ADGND	—	Analog system ground	45	REXC	—	No connection
8	VRT	—	ADC reference voltage Hi level input	46	VREFC	—	DAC reference voltage input (2)
9	VB	O	ADC comparator bias voltage	47	CBLC	—	DAC bypass capacitor connection (2)
10	DVDD	—	Digital system VDD	48	CO	O	C signal output
11	ADVDD	—	Analog system VDD	49	DAGND	—	GND
12	Y	I	Y signal input	50	TS1	I	Test-use pin
13	BS	I	Test-use pin	51	TS2		
14	RY	I	R-Y signal input	52	(NC)	—	No connection
15	TN	I	Test-use pin	53	TS3	I	Test-use pin
16	BY	I	B-Y signal input	54	TS4		
17	ALLR	I	Test-use pin	55	TS5		
18	VRM	—	ADC reference voltage intermediate tap	56	DA6	I	Digital signal input
19	VRB	—	ADC reference voltage Lo level input	57	DA7		
20	DGND	—	Digital system ground	58	DA8		
21	DGND	—	Digital system ground	59	DACONT	I	Test-use pin
22	SIFTC	I	Sub picture position shift	60	SUB VDD	—	Substrate VDD
23	CJUG	I	Sub picture on/off signal input	61	CP	—	PLL phase comparator filter
24	DGND	—	Digital system ground	62	PLLGND	—	PLL ground
25	VODD	—	Oscillator VDD	63	FSCI	I	Main picture burst lock fsc input
26	RCI	O	Read clock feedback signal	64	PLLVDD	—	PLL VDD
27	RC	I	Read clock signal input	65	DVDD	—	Digital system VDD
28	PADJ2	I	Sub picture output timing control (2)	66	SO2	I	Memory read data input
29	MCP	O	Pedestal clamp timing signal	67	SO3		
30	OUTC	O	Sub picture output timing signal	68	SO1		
31	CLIP	O	Sub picture noise clip timing signal	69	SO4		
32	WAKU	O	Sub picture frame output timing signal	70	SC	O	Serial read clock output
33	DACK	I	DAC clock	71	A7 (MSB)	O	Memory address data output
34	DA1	I	Digital signal input	72	A4		
35	DA2			73	A3		
36	DA3			74	A5		
37	DA4			75	A2		
38	DA5			76	A6		
				77	A1		

No.	NAME	I/O	FUNCTION
78	RASN	O	Memory row address assigned output
79	A0 (LSB)	O	Memory address data output
80	WEN	O	Sub picture data write control output
81	CASN	O	Memory column address assigned output
82	D2	O	Memory write data output
83	D3		
84	D4		
85	D1		
86	DTN	O	Memory data transmission mode/read mode control output
87	PHD	I	Main picture horizontal sync signal input
88	PVD	I	Main picture vertical sync signal input
89	VFSW	I	Vertical filter on/off signal input
90	STILL	I	Sub picture still mode control
91	MPLAY	I	Control signal for special playback
92	CHD	I	Sub picture horizontal sync signal input
93	CVD	I	Sub picture voltage sync signal input
94	MSUB	I	Multi sub picture on/off signal input
95	CLCT	I	Test-use pin
96	TRIM	I	Test-use pin
97	WCO	I/O	Test-use pin
98	BLP	O	Blanking pulse output
99	WC	I	Write clock signal input
100	WCI	O	write clock feedback signal

■ HA11569FS (IC3501)
P IN P CHROMA DECODER

●Block Diagram



Vcc (12V)
Vcc
Vcc
GND
GND
PinP SW
TinT SW
PinP Y OUT
PinP INV SW
PinP CHROMA OUT
H.REG ADJ
H.REG OUT
REG
V.REG OUT
V.REG ADJ
MAIN V.SYNC
MAIN AFC FILTER
MAIN 32fH VCO
MAIN H SYNC
MAIN BGP FILTER
MAIN HD O/P
MAIN VD O/P
Vcc
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
43
42
41
MAIN Y or Y + C I/P
SUB Y or Y + C I/P
SUB C I/P
MAIN C I/P
MAIN C O/P
MAIN ACC FILTER
MAIN 1st BPA I/P
MAIN Killer FILTER
MAIN VCO
MAIN TINT
MAIN FSC O/P
MAIN APC
Vcc (MAIN)
GND
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
GND
inj
MAIN V.SYNC FILTER
MAIN SYNC DET ADJ
MAIN SYNC DET FILTER
SUB 32fH VCO
SUB AFC FILTER
SUB V.SYNC
SUB HSYNC
SUB BGPGEN FILTER
NO SUB SIG
SUB HD O/P
SUB VD O/P
SUB V.SYNC FILTER
SUB SYNC DET ADJ
40
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
Y MAIN/SUB SW
CHROMA MAIN/SUB SW
Y MAIN/SUB SW + AMP
CHROMA MAIN/SUB SW + AMP
MAIN CHROMA SW
1st BPA 2nd BPA ACC
KILLER APC
PHASE SHIFT
VCO + TINT
BLACK LEVEL CONTROL
SUB CHROMA AMP
Y/C MIX SW
SUB BPA
Y/C MIX Y.PEAK
R-Y, B-Y DEMO
SUB Y.AMP (x 1.4)
REFERENCE VOLTAGE REGURATOR
H.AFC
COUNT DOWN
H.V SYNC.SEP BGP H.DRIVE V.DRIVE
SYNC DET
COUNT DOWN
H.AFC
H.V SYNC.SEP BGP H.DRIVE V.DRIVE
KILLER APC
1st BPA 2nd BPA ACC
PHASE SHIFT
SYNC DET
VCO + TINT
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
Vcc (SUB)
SUB C I/P
Y.PEAK
SUB Y I/P
FLAM SWSIG I/P
MAIN/SUB SW (OVTC)
BLACK DET
SUB B-Y O/P
SUB R-Y O/P
FLAM GEN
SUB Y O/P
NO MAIN SIG
BLK I/P
SUB DEMO I/P
SUB BPA O/P
SUB APC
SUB 1st BPA I/P
SUB ACC FILTER
SUB C O/P
SUB Killer FILTER
SUB VCO
SUB SYNC DET FILTER

■PD5299A (IC451)
SYSTEM CONTROL MICROCOMPUTER

●Pin Function

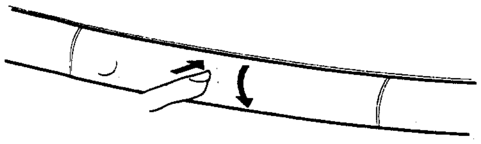
[Note] I : CMOS input O : CMOS output N : Nch open drain output

No.	NAME	I/O	FUNCTION	ACT.
1	OSC1	I	Display clock input/output.	—
2	OSC2	O		
3	KEY	I	Main unit key scan signal input. Reads PD5136 format signals.	L
4	OPTION	I	OPTION voltage input. (H: KU / L: KC)	—
5	REMOTE	I	Remote control signal input. Reads SR format signals.	L
6	AFT	I	AFT analog voltage input.	—
7	COLOR	N	Color level control PWM output.	H
8	TINT	N	Tint level control PWM output.	H
9	CONTR	N	Contrast level control PWM output.	H
10	BRIGHT	N	Brightness level control PWM output.	H
11	SHARP	N	Sharpness level control PWM output.	H
12	DETAIL	N	DETAIL control PWM output.	H
13	VOLUME	N	Audio level control PWM output.	H
14	N.C.	N	Not used.	—
15	H SYNC	I	Tuner reception horizontal sync count input. Determined as "Broadcast station" when the number of H-SYNCs in 1 msec is 12 to 18 for eight consecutive times, and determined as "No broadcast station" when other states continue for 6 consecutive times.	—
16	AC CLK	I	AC clock detection input. Used for AC power supply OFF detection. (Reset processing is performed at 100 msec AC drop.)	—
17	A_MUTE	O	Audio mute output AUDIO MUTE output for when the MUTE key function is on, input switching, and power on/off.	H
18	N.C.	O	Not used.	—
19	N.C.	N	Not used.	—
20	SCHK	I	I^{2}C serial transfer clock check input	—
21	SCLK	N	I^{2}C serial transfer clock Audio multiple IC Used for the E^{2}PROM	—
22	SDATA	I/N	I^{2}C serial data input/output	
23	N.C.	N	Not used.	—
24	DATA IN	I	Serial data input. Used for PLL, Dolby, DSE, PINP, digital/ analog ICs.	—
25	CLK	N	Serial clock.	
26	DATA OUT	N	Serial data output.	
27	CNVSS		Connected to Vss.	—
28	N.C.	O	Outputs timings.	—
29	RESET	I	System reset. Reset when L is input for more than 0.95 µsec (OSC=4.19 MHz).	L
30	Xin	I	Main clock generation circuit input/ output pin. Connected to the 8.0 MHz ceramic oscillation pin.	—
31	Xout	I		—
32	Vss		Supplies 0V to Vss.	—
33	CONV B-MUT	O	R, G, B MUTE output.	H
34	CONV-G-MUT	O		H
35	CONV R-MUT	O		H
36	PEAK ACL OFF	O	Operates when contrast is MAX.	H
37	N.C.	O	Not used.	—
38	N.C.	O	Not used.	—
39	N.C.	O	Not used.	—
40	N.C.	O	Not used.	—
41	N.C.	O	Not used.	—
42	RELAY	O	Power supply relay control signal output. ON → L OFF → H	L
43	P ENB	O	Port expander M66320 strobe input switching, PinP control, RECOUT MUTE, TV MUTE	H
44	CONV MUTE CE	O	Converter IC (PM0002A) MUTE output	L
45	CONV CE	O	Converter IC (PM002A) data enable	L
46	TV CE	O	PLL IC (TD6359) data enable	H
47	C.C RESET	O	CCD microprocessor hard reset output.	—
48	C.C ENB	O	CCD microprocessor data enable.	L
49	V MUTE	O	Video mute output.	—
50	N.C.	O	Not used.	H
51	HALF	O	Gray display part ON/OFF control output.	H
52	S RST	O	I^{2}C serial line microprocessor block external connection switch H:External connection	H
53	ANT_SM	O	ANT selecting switch.	—
54	TV_MUTE	O	TV audio mute output.	L
55	TV_TEST	I	Tuner test mode detection input	L
56	TV_LOCK	I	PLL lock detection input	L
57	BLK_OUT	O	OSD video output.	H
58	TEST_CRS	O		H
59	B	O		H
60	G	O		H
61	R	O		H
62	VSYNC	I	OSD sync signal input.	L
63	HSYNC	I		L
64	VDD	I	Power supply. Supplies +5V.	—

12. FACILITIES

● FRONT PANEL FACILITIES

A flip-down door conceals the control panel. Push gently and release, to open the door. To close the door, lift it back up into place.Push and release to open.



NOTE:
If you accidentally pull the door, it may not shut properly. Push in when shutting the door to restore it to normal operation.

① MAIN POWER switch

Main power switch of this unit.
If the power is turned off in the STANDBY mode (RED indicator) or ON mode (GREEN indicator), the current mode will be memorized.

② POWER switch and indicator (STANDBY/ON)

Press once to turn on the power. Press again to turn the power off. The POWER indicator lights up in green when the power is on. The indicator lights up in RED in the STANDBY mode.

③ INPUT SELECTOR button

Press to select your program source: TV, LD player or VIDEO . Each press of the button changes the selection to the next source.

④ ANTENNA SELECTOR (A/B) button

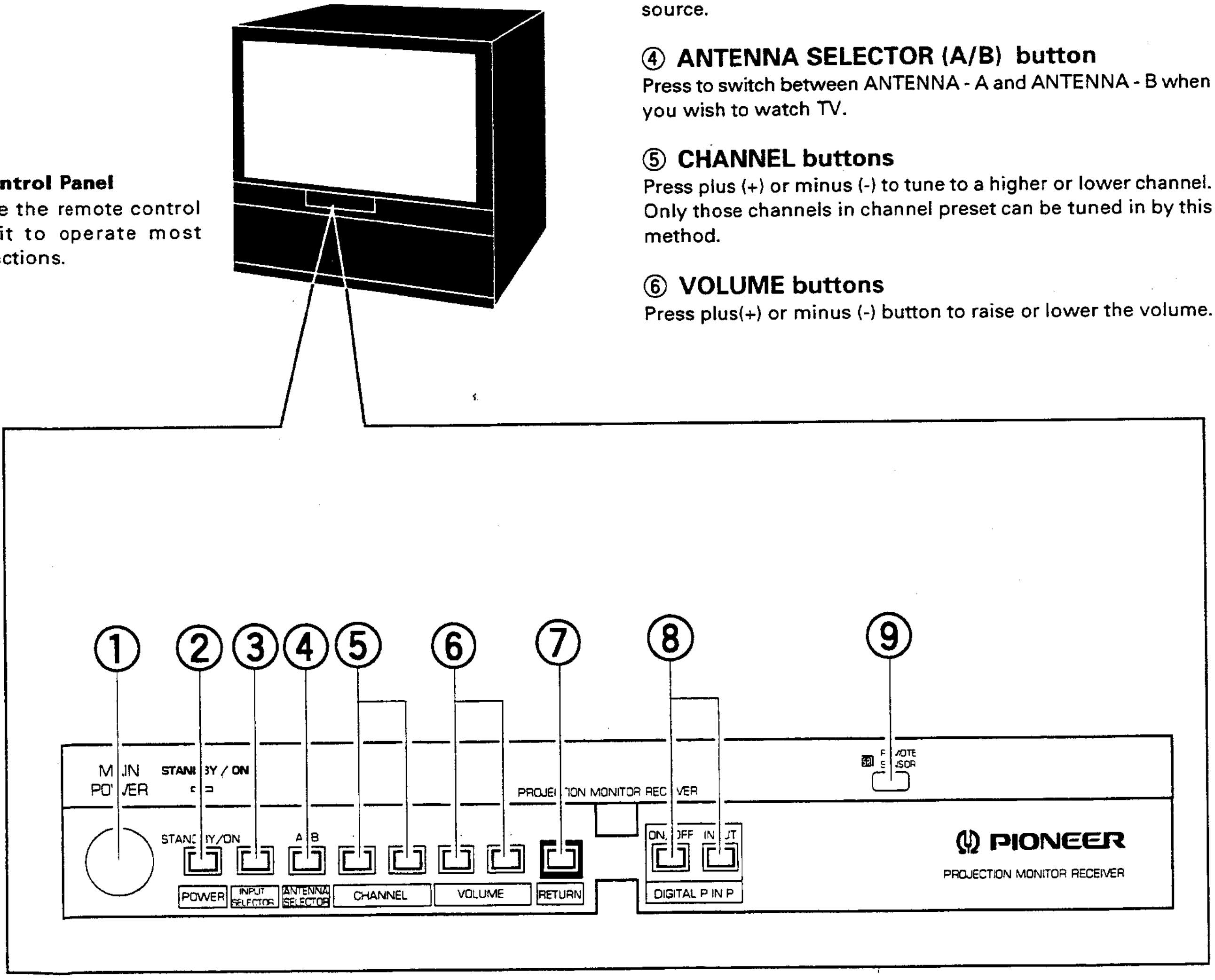
Press to switch between ANTENNA - A and ANTENNA - B when you wish to watch TV.

⑤ CHANNEL buttons

Press plus (+) or minus (-) to tune to a higher or lower channel. Only those channels in channel preset can be tuned in by this method.

⑥ VOLUME buttons

Press plus(+) or minus (-) button to raise or lower the volume.



Control Panel
Use the remote control unit to operate most functions.

①
②
③
④
⑤
⑥
⑦
⑧
⑨
MAIN POWER
STANDBY / ON
STANDBY/ON
A B
PROJECTION MONITOR RECEIVER
REMOTE SENSOR
ON/OFF
INPUT
POWER
INPUT SELECTOR
ANTENNA SELECTOR
CHANNEL
VOLUME
RETURN
DIGITAL P IN P
PIONEER
PROJECTION MONITOR RECEIVER

ATTENTION
The Projection Monitor Receiver will not function properly in the following cases.
- •Lightning storms.
- •High static electricity environment.
- •Poor voltage regulation in the power source.

If the Projection Monitor does not operate properly, reset it as follows:
1. Unplug from the power supply for approximately 1 minute.
2. Plug the power cord in again to reset it.

⑦ RETURN button

Press to set the Projection Monitor to its initial mode instantly if either sound or picture disappear from the speaker system or the screen during adjustment.

- Adjust the Projection Monitor again after pressing the RETURN button, as all settings have been cleared.

When the RETURN button is pressed, the Projection Monitor is set as follows:
PICTURE: Parameters set to 0.
VOLUME: Remains at the last setting.
P-IN-P/MUTE: Set to OFF.
INPUT SELECTOR: Set to TV.
TV CHANNEL: Remains at the last channel set.
MTS: Remains at the last setting.
CC: CC-OFF

- When this button is pressed during the outer point convergence, the outer point convergence contents return to the initial state.

⑧ DIGITAL P IN P (Picture-in-Picture) buttons

ON/OFF:	Press to turn the Picture-in-Picture function on and off.
INPUT:	Press to select the input source for the sub-picture.

NOTES:

- *When the P IN P ON/OFF button is pressed and held for more than 4 seconds, the Projection Monitor will go into its demonstration mode (see front cover).*
  When buttons other than P IN P ON/OFF are pressed,the demonstration mode ends.

⑨ REMOTE SENSOR

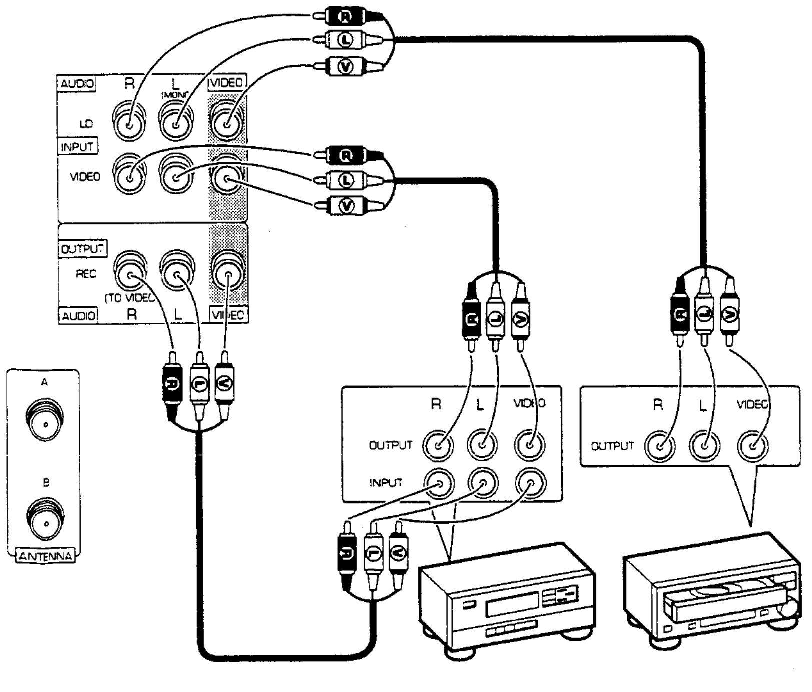
This sensor picks up infrared signals from the remote control unit.

NOTE:

On rare occasions, an electrical discharge may occur inside the CRT. It makes a short, sharp pop and either no sound is produced or the volume level changes by itself. The Picture-in-Picture function will be cancelled automatically if an electrical discharge occurs when this function is engaged.
When other abnormal functionings are suspected, turn off the power of the unit with ① MAIN POWER switch, and after some time, turn on the power with ① MAIN POWER switch and ② POWER switch. If the abnormal functionings cannot be corrected or repeat, contact an authorized PIONEER service center.

Caution:
Do not press any operation button on the Projection Monitor or on the remote control unit while recording is in progress. Signals from the REC jacks may be temporarily interrupted when a button is pressed.

● REAR PANEL FACILITIES



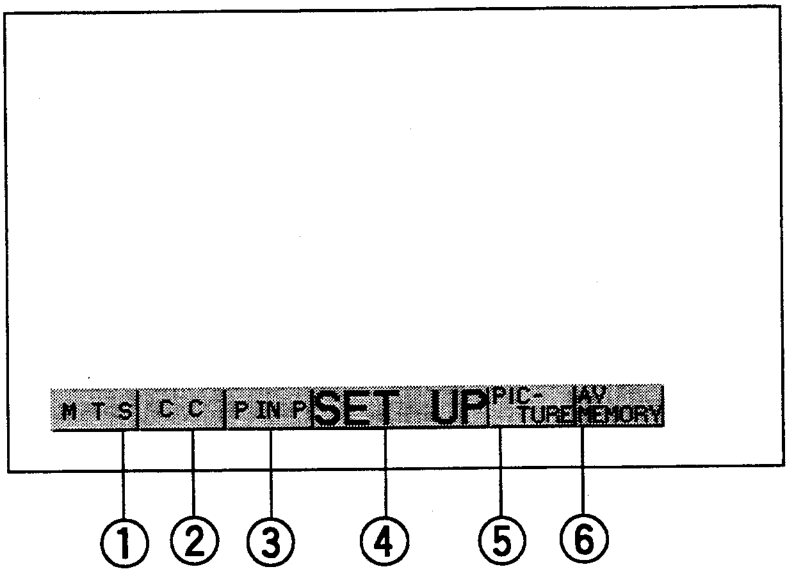
INPUT jacks

There are 2 sets of inputs for VCR and LD Players. Use RCA-type pinplug cords (the same as those used in hi-fi systems) for connections. When the audio source to be connected is monaural, connect the source to the L-(MONO)jack.

OUTPUT TO VIDEO REC jacks

These are used for connecting the monitor to a VCR for recording, or for linking it to another monitor. These jacks output the video and audio signals of the source currently selected by the INPUT SELECTOR. Connect these output jacks to your VCR's inputs. Connect the VCR's outputs to the monitor's VIDEO inputs.

● MENU FACILITIES



① MTS menu

Select to switch the sound mode of TV.
This will not be displayed when LD or VIDEO is selected with the INPUT SELECTOR button.

② CC MODE menu

Select to choose the mode of displaying the character information contained in closed caption broadcasting.

Select from OFF, CC-1, CC-2, CC-3, CC-4, T-1, T-2, T-3, or T-4.

③ Picture-in-Picture Control buttons

Any program source connected to the Projection Monitor can be displayed on the screen simultaneously with any other source.

ON / OFF:	Select to turn the Picture-in-Picture function on and off.
INPUT:	Select to choose the input source for the subpicture.
SWAP:	When only one subpicture is displayed, select to exchange the position of the main picture and subpicture.
SHIFT:	Select to move the subpicture to a different place on the screen.

④ SET UP menu

Select to perform each setting (CONVERGENCE, INPUT LABEL, CHANNEL SET UP).

⑤ PICTURE menu

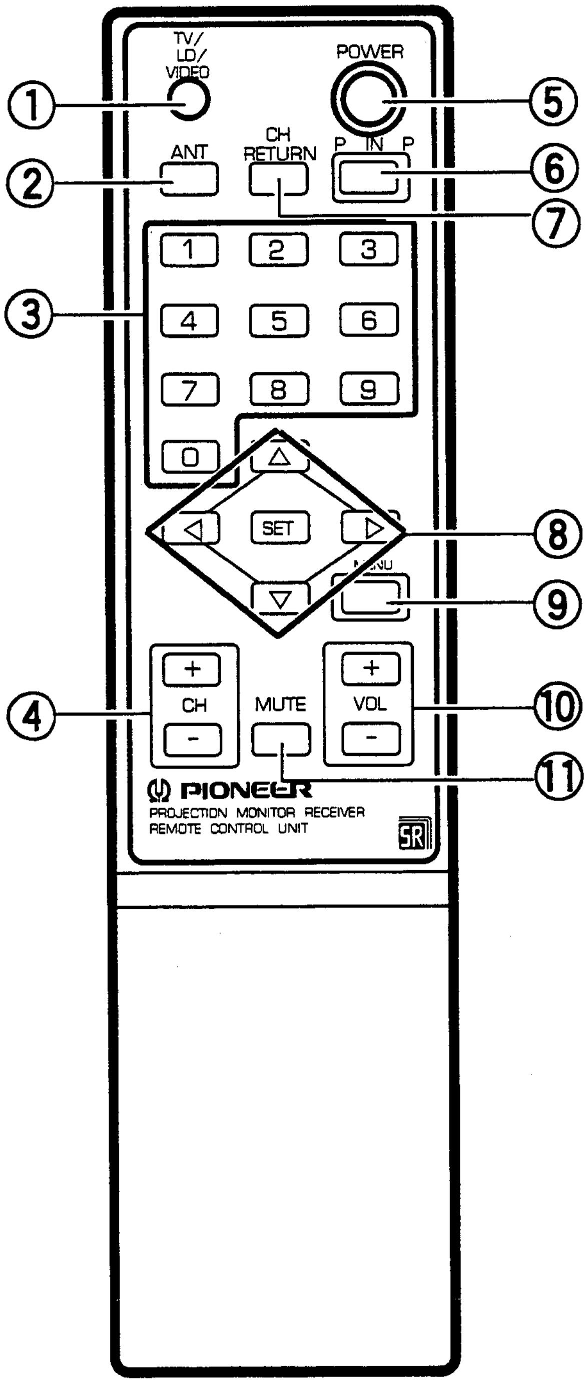
Select to adjust the picture quality.

⑥ AV MEMORY menu

Select to recall and set the AV MEMORY.

NOTE:
The "EXIT" item may be displayed on the screen when selecting menus. If EXIT is selected, the screen will return to the previous display.

● REMOTE CONTROL UNIT FACILITIES



① INPUT SELECTOR button(TV/LD/VIDEO)

Press the button to select the source you wish to watch. The screen will display your selection.

② ANT (antenna selector) button

Press to switch between ANTENNA - A and ANTENNA - B when you wish to watch TV.

③ Direct Channel Selection buttons

Press the button (or buttons) that correspond to the channel that you wish to watch, to switch directly to that channel from any other channel.

④ CH (Channel) + , - buttons

Press plus (+) or minus (-) to tune in a higher or lower channel. Only those channels in channel preset can be tuned in by this method.

⑤ POWER button (STANDBY/ON)

⑥ P IN P button

Press to turn the Picture-in-Picture function on and off.

⑦ CH RETURN (channel return) button

Press to switch between the current channel and the channel you were watching immediately before. This is useful, for example, if you wish to switch back and forth between two sporting events.

⑧ Select/Adjust/Set buttons (Set ▲, ▼, ◄, ►)

▲, ▼, ◄, ► : Press to select, adjust or set items on the menu screen.

SET: Press to activate the selected function.

⑨ MENU button

Press to turn on the menu screen for use in function selection. Press again to return to normal operation.
The selected items are displayed in purple, and the items can be selected with the ▲, ▼, ◄ or ► buttons.

⑩ VOL (Volume) + , - buttons

Press the + button to increase the volume and the - button to decrease it. Volume adjustment will appear on the screen as numbers and a bar graph. '63' indicates the maximum volume level.
The display will disappear from the screen after 2 seconds.
*Volume display will change color automatically according to the selected input mode.

Display colors
TV : Green
LD : Cyan (Greenish Blue)
VIDEO : Purple

⑪ MUTE button

Press to temporarily turn off the sound. Press again to return to the previous volume level. This is useful, for example, when answering the telephone. The volume display will turn red while the mute function is engaged and will disappear from the screen when the mute function is cancelled. If the mute function is left on for over approx. 8 minutes, the function will be cancelled automatically, and the volume level will be reset to 0.

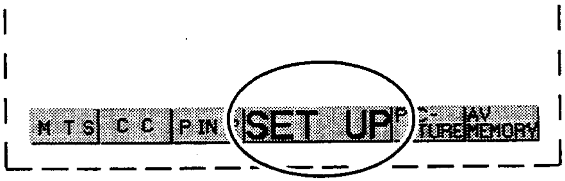
13. CHANNEL PRESET AND PASSWORD CODE

AUTO CHANNEL PRESET

- Automatically presets channels in your area.

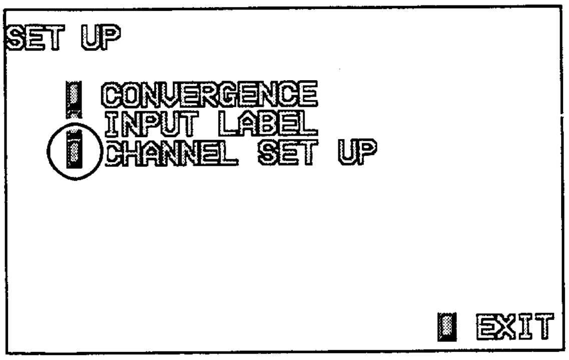
1 Press the INPUT SELECTOR button on the remote control unit or press the INPUT SELECTOR button on the control panel so that "ANT A CHXX" appears on the monitor screen.

2 Turn on the menu with the MENU button and press the ◄ or ► button so that the SET UP display turns purple.


M T S
C C
P IN
SET UP
AV MEMORY

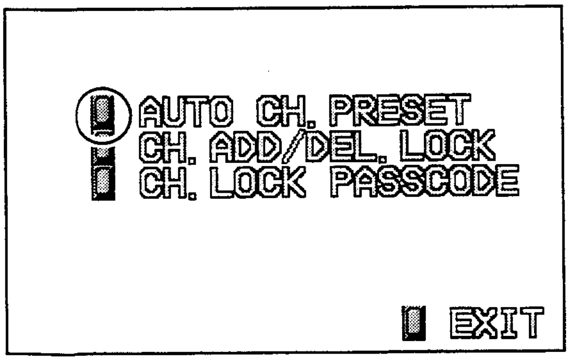
3 Turn on the SET UP menu with the SET button and select the CHANNEL SET UP with the ▲ or ▼ button.

- The selected item (▮) turns purple.


SET UP
CONVERGENCE
INPUT LABEL
CHANNEL SET UP
EXIT

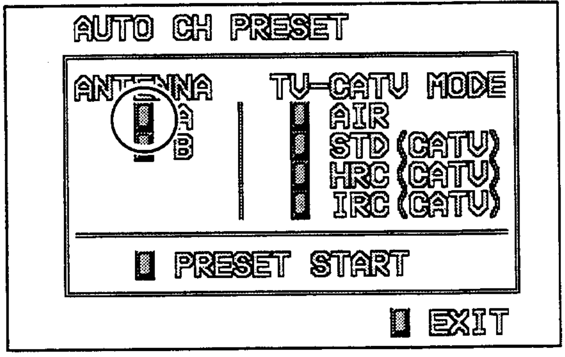
4 Turn on the CHANNEL SET UP menu with the SET button and select the AUTO CH PRESET with the ▲ or ▼ button.

- The selected item (▮) turns purple.


AUTO CH. PRESET
CH. ADD/DEL. LOCK
CH. LOCK PASSCODE
EXIT

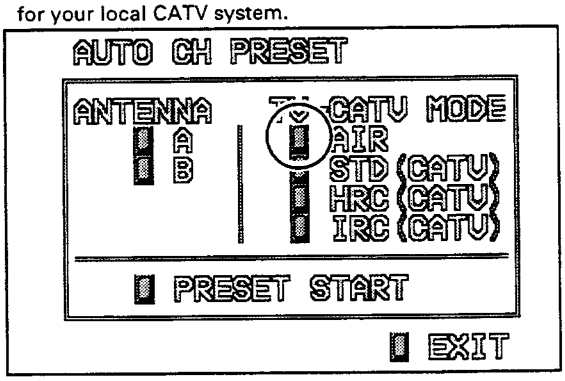
5 Press the SET button and select A or B from the ANTENNA item with the ▲ or ▼ button.

- The selected item (▮) turns purple.
- A is selected as an example.

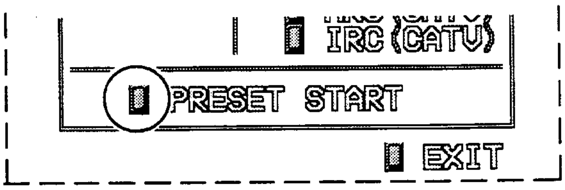

AUTO CH PRESET
ANTENNA
A
B
TV-CATV MODE
AIR
STD (CATV)
HRC (CATV)
IRC (CATV)
PRESET START
EXIT

6 Press the SET button (A turns yellow) and select AIR, STD, HRC or IRC from the TV - CATV mode with the ▲ or ▼ button.

- The selected item (▮) turns purple.
- AIR is selected as an example.
- Ask your dealer or cable service provider which is correct for your local CATV system.

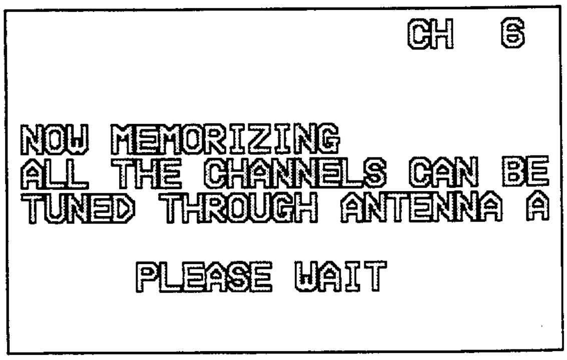

AUTO CH PRESET
ANTENNA
A
B
TV-CATV MODE
AIR
STD (CATV)
HRC (CATV)
IRC (CATV)
PRESET START
EXIT

7 When the 5 and 6 settings are completed, the PRESET START (▮) turns purple.


IRC (CATV)
PRESET START
EXIT

8 Press the SET button.

- AUTO CHANNEL PRESET starts.



NOW MEMORIZING
ALL THE CHANNELS CAN BE
TUNED THROUGH ANTENNA A

PLEASE WAIT

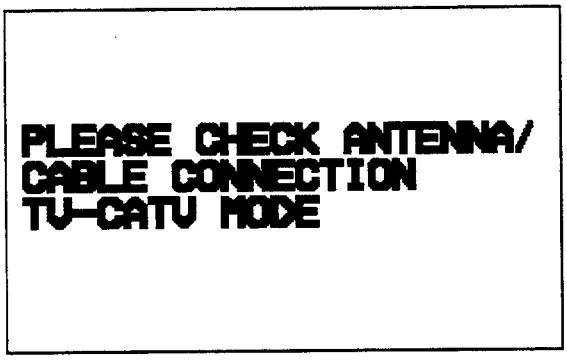
9 Press MENU button to return to normal operation.

- When AUTO CHANNEL PRESET ends, step 6 is returned, and ANTENNA B is selected automatically. Perform steps 5 and 8 if ANTENNA B is being used.

NOTE:

- *If EXIT is selected after 7 is selected, the screen will return to previous display. If AUTO CHANNEL PRESET is not performed, return to the display before by selecting EXIT after selecting TV-CATV mode, select CH. ADD/DEL, LOCK, and select the channel to be received.*
- *If the ANTENNA is not connected, the following will be displayed.*

Check if the antenna/cable is connected.



PLEASE CHECK ANTENNA/
CABLE CONNECTION
TV-CATV MODE

ADDING, DELETING, AND LOCKING CHANNELS

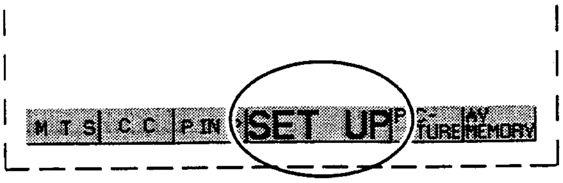
- Channels preset can be added or deleted by AUTO CHANNEL PRESET.

ADD	Manually presets channels that were not preset by AUTO CHANNEL PRESET.
DEL	Deletes channels that are not required for reception.When this setting is set, the channels can be skipped when receiving channels with the + and - CH (channel) buttons.
CH LOCK	Sets channels so that they will be concealed from users who do not input the password code. The method of setting this function is described from 7 of page 20. See page 21 for the method of inputting the password code.

- Perform the following after completing AUTO CHANNEL PRESET.

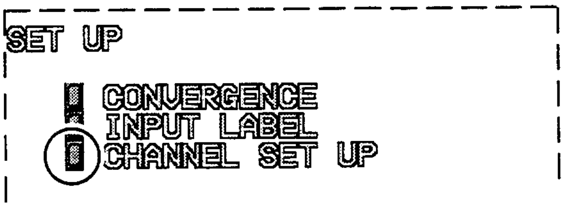
1 Press the INPUT SELECTOR button on the remote control unit or press the INPUT SELECTOR button on the control panel so that "ANT A (or B) CHXX" appears on the monitor screen.

2 Turn on the menu with the MENU button and press the ◄ or ► button so that the SET UP display turns purple.



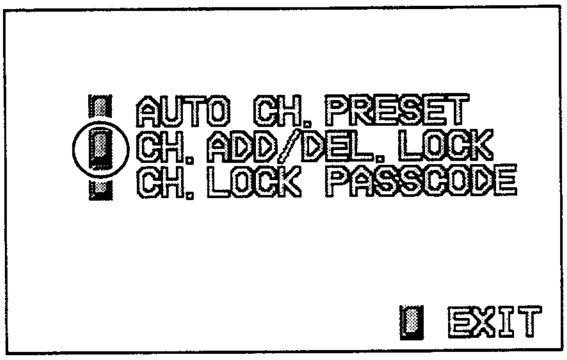
3 Turn on the SET UP menu with the SET button and select the CHANNEL SET UP with the ▲ or ▼ button.

- The selected item (▮) turns purple.



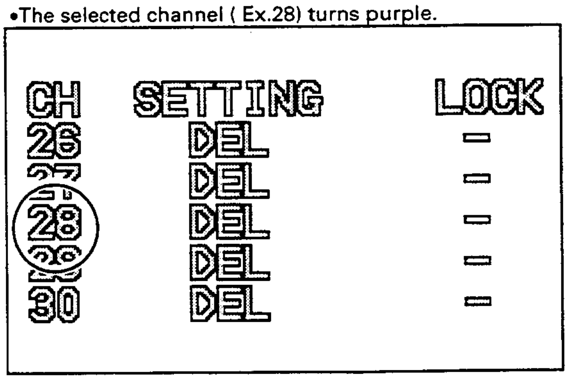
4 Turn on the CHANNEL SET UP menu with the SET button and select the CH. ADD / DEL, LOCK with the ▲ or ▼ button.

- The selected item (▮) turns purple.



5 Press the SET button and select the channels to be added and deleted with the ▲ or ▼ button.

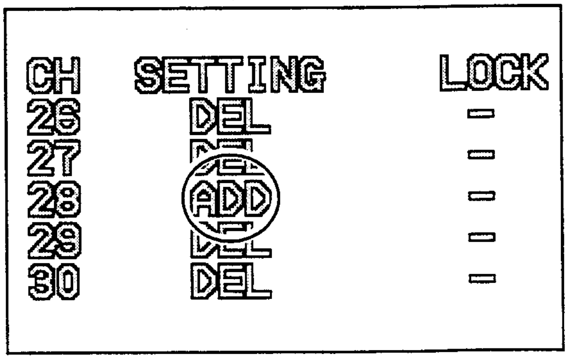
- The selected channel (Ex.28) turns purple.



CH	SETTING	LOCK
26	DEL	▭
27	DEL	▭
28	DEL	▭
29	DEL	▭
30	DEL	▭

6 Press the SET button and select ADD (add) or DEL (delete)with the ◄ or ► button.

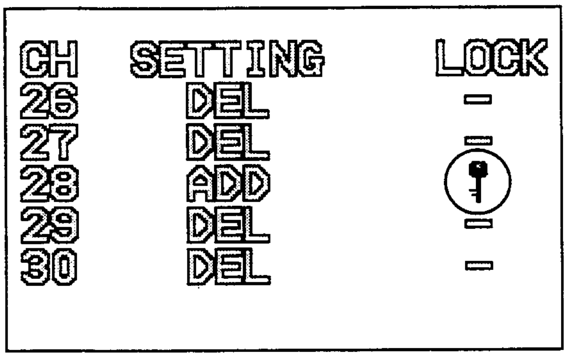
- When ADD is selected, ADD and ▭ turn yellow.



CH	SETTING	LOCK
26	DEL	▭
27	DEL	▭
28	ADD	▭
29	DEL	▭
30	DEL	▭

7 **Press the SET button and select channel lock (🔑) with the ◄ or ► button to lock the channel.**

- Can be set from the 🔑 to ═ only after the password code has been entered.



CH	SETTING	LOCK
26	DEL	═
27	DEL	═
28	ADD	🔑
29	DEL	═
30	DEL	═

NOTE:
As CH LOCK locks the channel number, when the TV-CATV mode is changed, it has to be set again.

8 **Repeat steps 5 to 7.**

9 **Press the MENU button to return to normal operation.**

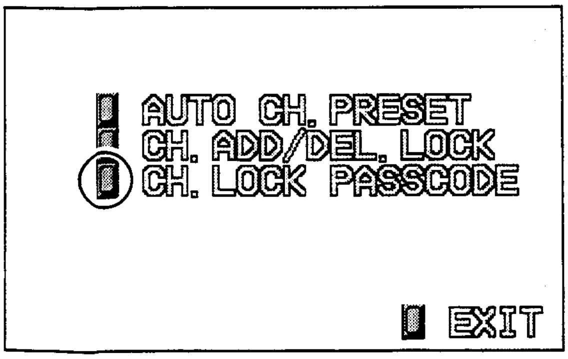
ENTERING THE PASSWORD CODE FOR CHANNEL LOCK

- Enter the password codes. You can view the locked channel program.

1 **Perform steps 1 to 3 on page 19.**

2 **Turn on the CHANNEL SET UP menu with the SET button and SELECT the CH. LOCK PASSCODE with the ◄ or ► button.**

- The selected item (▮) turns purple.

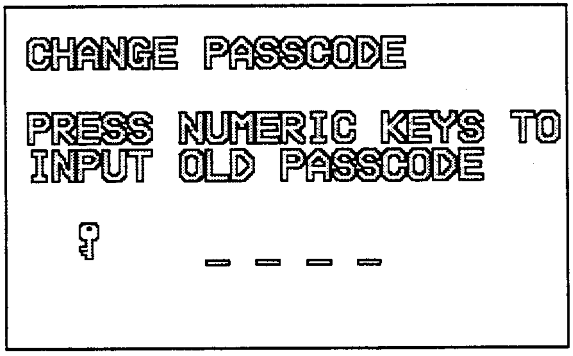


▮ AUTO CH. PRESET
▮ CH. ADD/DEL. LOCK
▮ CH. LOCK PASSCODE

▮ EXIT

3 **Press the SET button (CH.LOCK PASSCODE turns purple) and input the old password code with the numerical buttons of the remote control unit.**

- This password code is set to "0000" when the monitor leaves the factory.

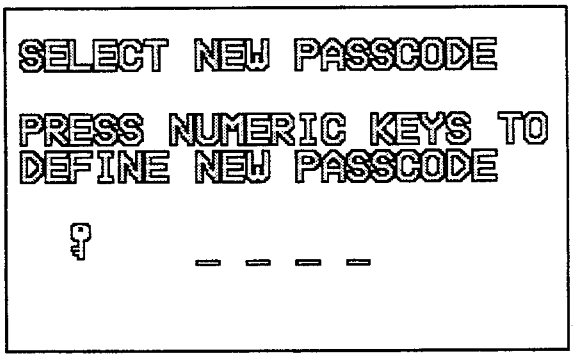


CHANGE PASSCODE

PRESS NUMERIC KEYS TO
INPUT OLD PASSCODE

🔑 ═ ═ ═ ═

4 **Input the new password code with the numerical buttons of the remote control unit.**



SELECT NEW PASSCODE

PRESS NUMERIC KEYS TO
DEFINE NEW PASSCODE

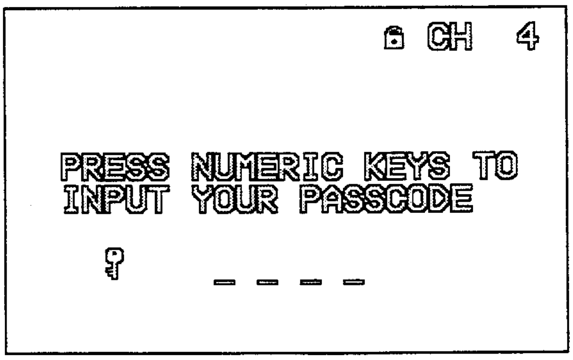
🔑 ═ ═ ═ ═

5 **Press the MENU button to return to normal operation.**

To view channel locked

1.select the locked channel.

- The following will be displayed.



🔒 CH 4

PRESS NUMERIC KEYS TO
INPUT YOUR PASSCODE

🔑 ═ ═ ═ ═

2.Enter the password code.

Channel lock password code No. ☐ ☐ ☐ ☐

•If you forget the password code
Press the RETURN button on the front panel for more than four seconds. The password code will become "0000".

14. SPECIFICATIONS

DISPLAY SECTION

Reception system .... American TV standard NTSC system
Screen size .... 60" (SD-P6081)
.... 51" (SD-P5181)
.... 46" (SD-P4681)
CRT .... 7"High focus CRT × 3
Brightness(White peak) 430 (SD-P6081)
.... 600 (SD-P5181)
.... 700 (SD-P4681) Foot-Lambert
.... [100% Window signal input contrast, bright Max.]
Actual viewing angle .... Horizontal H = 140°
.... Vertical V = 45°
Horizontal resolution .... 1000 lines (SD-P6081)
.... 830 lines (SD-P5181)
.... 770 lines (SD-P4681)
.... [Input digital test pattern (1000 lines resolution)]
Input terminals .... 2 video input systems,
.... 2 audio input systems
Output terminals .... REC OUTPUT (To VIDEO)
.... Video output, audio output (For recording)×1
Input signal .... Video signal: 1.0 Vp-p ± 0.2V (75 ohms load)
Audio signal: 500mV rms
Input impedance .... Video input: 75 ohms ± 10%
Audio input: 22 kilo-ohms or more
Input signal polarity .... Synchronized negative
Output terminal signal ratings:
Output terminals
(Except VIDEO) .... Video signal: 1Vp-p (75 ohms load)
Audio signal: 500 mV rms (100% modulation)
Output impedance .... Video output: 75 ohms ± 10%
Audio output: Less than 1 kilo-ohms

TUNER SECTION

Circuit type .... Video signal detection
.... PLL full synchronous detection
.... PLL digital synthesizer system
.... Audio multiplex: BTSC system
Reception channels.. VHF; CH2 ~ CH13, UHF; CH14 ~ CH69
.... CATV (STANDARD, HRCor IRC)
.... CATV A-5 CH ~ W+84CH
Antenna terminals
.... ANTENNA terminal, 75 ohms UNBAL,
.... F-type connector(VHF, UHF MIXED)

AMPLIFIER SECTION

Effective output
Front both channels driven .... 2W × 2W
(THD. 1.5% 50 Hz to 15,000Hz, 16 ohms)
Built-in speaker system .... 10cm (3-15/16 in) full range × 2

ELECTRICAL SECTION, MISCELLANEOUS

Power requirements .... 120 V AC, 60 Hz
Power consumption .... 240 W, 500 VA (CSA)
External dimensions
SD-P6081 .... 1431 (W) × 675 (D) × 1429 (H) mm
56-5/16 (W) × 26-9/16 (D) × 56-1/16 (H) inch
SD-P5181 .... 1240 (W) × 655 (D) × 1302 (H) mm
48-13/16 (W) × 25-3/4 (D) × 51-1/4 (H) inch
SD-P4681 .... 1134 (W) × 605 (D) × 1232 (H) mm
44-5/8 (W) × 23-13/16 (D) × 48-1/2 (H) inch

Weight of main unit
SD-P6081 .... 122 kg (269 lb)
SD-P5181 .... 101 kg (222 lb 11 oz)
SD-P4681 .... 88kg (194 lb)

WIRELESS REMOTE CONTROL UNIT

Operation system .... Infrared remote control system
Power source Two DURACELL "AA"MN1500 1.5V alkaline dry cell batteries
Dimensions .... 45 (W) × 18 (H) × 185 (D) mm
1-1/4 (W) × 11/16 (H) × 7-1/4 (D) inch
Weight .... 65g (2 oz) (without batteries)

ACCESSORIES

Operating instructions 1
Warranty card 1
Remote control unit 1
DURACELL AA"MN1500 1.5 V alkaline dry cell batteries 2

NOTE:

Specifications and design subject to possible modifications without notice due to improvements.

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O-ISO FEB. 1995 Printed in Japan